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Bacillus Calmette-Guérin (B.C.G.)

Animal Experimentation and Prophylactic Immunization of Children

An Analysis and Critical Review

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THE feverish enthusiasm manifested in the wholesale antituberculosis vaccination in European countries, and mainly in France, has accomplished one very good purpose. It has administered a stimulus to the stagnant question of prophylactic immunization.

The literature on B.C.G. vaccination is rapidly accumulating. Nearly 100,000 infants have been treated by this method. It is surprising that only a small number of them have come up for a statistical study. The favorable results reported have been gained largely from impressions and not from facts. On account of the many inquiries which have come to our attention the present review has been written.

The gradual decline year after year in the mortality from tuberculosis as shown by reliable statistics, is the best index that the campaign adopted years ago is sound and effective. This campaign has also influenced the death rate due to other causes, with the exception of heart disease and cancer. Education, sociological activities and various health measures stimulated by prosperity have played an important part in the improvement of living conditions and in the prolongation of life. However, this decline of mortality from tuberculosis has in no way influenced the investigator to discontinue his search for a method which can be safely used for vaccinating children against tuberculosis.

Attempts at prophylactic immunization against tuberculosis date from the time of the discovery of the microörganism. Koch, Pasteur, Trudeau, Dixon, Maragliano, Pearson and Gilliland, Theobold Smith, Calmette, Römer, Baldwin, Webb and Williams and many others have tried to devise some method which could be used safely for this

purpose. Many methods have been studied and recommended. The methods which most demand our attention today are three: Vaccination with (1) virulent living, (2) avirulent living, and (3) heat-killed virulent tubercle bacilli. In the following pages the discussion will be limited to the method advocated by Calmette and his coworkers, which consists of vaccination with avirulent living organisms.

PREMISES ON WHICH CALMETTE'S METHOD OF VACCINATION ARE BASED

The prevalence of tuberculous infection among children in the civilized world, as demonstrated by the tuberculin skin test, varies considerably. Hamburger and Monti [1] in Vienna reported 94 per cent positive reactions in children at the age of 12 years. In rural districts in Germany, Römer [2] found 66 per cent of the children to be infected at the age of 11. Very similar findings have been reported by S. Mueller [3] in Berlin, Moro [4] in Munich, Petruschy [5] in Dantzig and Northmann [6] in Dusseldorf. In Paris 35 per cent of apparently healthy children up to the age of 5 give a positive tuberculin reaction. Arnfinsen [7] studying 8000 children of various ages observed a positive reaction in 33 to 38 per cent. In the United States the incidence of infection detectable by the tuberculin reaction is not so great as that reported in European countries. Veeder and Johnston [8] in St. Louis observed a positive tuberculin reaction in 44 per cent of children from the ages of 10 to 14. Some children with clinical disease were included in this group. Slater [9] studied two groups of children in Minnesota: The first with no history of exposure reacted positively in 10 per cent, and the second who were living in tuberculous surroundings reacted positively in 80 per cent. Myers and Magiera [10] reported 41 per cent in a study of 2000 children in Minneapolis. Still,[11] in a group of 58 children with no history of tuberculosis and living in the lower East Side of New York City, observed only 9.8 per cent positive Pirquet tuberculin reactions.

The foregoing figures reveal the fact that by the time children reach the age of puberty, from 40 to 90 per cent may have become infected, the social and economic conditions mostly influencing the percentage of infection.

Let us for a moment examine the statistics of early infant infection which have stimulated the present activities for prophylactic immunization. McLean and Jeidell [12] examining 2000 infants under 1 year of age found a positive infection in 7.35 per cent, while in a second group of 512 children of 3 years of age it reaches 32.5 per cent. Spolverini [13] found 7 per cent positive reactions in a study of 900 infants of the same age, Sander [14] 6 per cent up to 2 years, and Armstrong [15] 15 per cent for the same period. In New York City, Drolet's

studies [16] reveal that from 10 to 12 per cent of all children become infected with tubercle bacilli before they reach 1 year of age. Taking the birth rate of 1923 when 130,000 infants were born, he calculates that in all probability 13,000 of these children became infected during the first year of life.

If we now turn our attention to the study of possible infection in children brought up in a family with a history of tuberculosis, the occurrence of the positive tuberculin reaction is materially increased. Harms and Seitz [17] studying 129 infants under 1 year of age reported 60 per cent positive tuberculin reactions, Röpke [18] 67.5 per cent and Barchetti [19] 73 per cent. The mortality from tuberculosis in the first year of life, after infection has occurred, appears to be very high. Brown [20] reports 70 per cent, Hemplemann [21] 78 per cent, Davis [22] 45 per cent, Reuben and Smith [23] 68 per cent, Lemaire [24] 57 per cent, Harms and Seitz [17] 23.9 per cent, Lozano [25] 26 per cent, and Wahlquist and Myers [26] 8.4 per cent. Petersen and Ostenfeld of Denmark, as quoted by the *British Medical Journal* [27] give only 6.2 per 1,000, while the same authors quoted by Calmette [28] give 7.7 per 100.

From these brief statistics it seems that infants are born with no appreciable resistance to an excessive infection. If they are born in families in which the tubercle bacilli are disseminated continuously, infection will probably take place almost immediately. Excessive infection takes place more often from contact with a tuberculous mother, and in the majority of instances a progressive disease is the result, which may later lead to meningitis or miliary tuberculosis. On the other hand, if the infant comes in contact with only a few organisms and at proper intervals, it may escape serious consequences.

Under ordinary circumstances, and not in tuberculous surroundings, without doubt children occasionally pick up a few organisms which find their way to the lymph nodes, setting up a small, non-progressive focus which according to the majority of investigators is responsible for a degree of resistance to progressive disease present in the human race. Statistics show that the percentage of positive tuberculin skin reactions increases with age, and conversely the mortality from tuberculosis diminishes as the child becomes older. It seems then, according to Calmette,[29] that in humans as in animals, an infection of mild nature is very desirable. The excessive infections must be avoided and the intervals well regulated. The organism used for producing mild infection should be of low virulence and the vaccination must be carried out in infants which have not been infected. The vaccinnation must be repeated from time to time in order to supply the lymph nodes with living organisms.

Calmette [29] is convinced that most of the infection in children takes place by the digestive route, for the reason that the intestinal mucosa of the infant during the first 10 days absorbs the organism much more readily than at any other time during life. If, according to this author, the infection takes place through the intestinal tract, then the same route must be used for vaccination. For this reason and also because of its simplicity, all Calmette's vaccinations have been carried on by feeding the organism to new-born babies. Two factors enter into the discussion when the method of vaccination is based on the use of living microörganisms: (1) Is it dangerous? (2) Is it effective?

I. PATHOGENICITY OF BACILLUS CALMETTE-GUÉRIN (B.C.G.)

The organism was isolated by Calmette and his associates in 1908. It was a bovine organism originally of moderate virulence for guinea pigs, rabbits and cattle, but after continuous cultivation on glycerinated potato bile medium it has lost its power of producing generalized tuberculosis, not only in cattle but also in small laboratory animals. Even in 1913 we find some reference that after 30 to 34 passages on this medium the organism had lost some of its pathogenicity. The authors claim that the environment and the medium have played a great part in the change. In an earlier publication Calmette and his coworkers claimed that the organism did not form tubercles or set up a tuberculin hypersensitiveness. Later they amended this statement in answering some of the objections made on the pathogenicity of this organism. We shall briefly review some of Calmette's experiments.[30]

When the organism was injected into the cellular tissue of the dewlap of newly born calves, it did not disseminate as in the case of a virulent organism, but remained localized at the site of inoculation for a year. Abscesses aspirated revealed acid-fast rods, which were not capable of infecting guinea pigs on subinoculation.

Subcutaneous inoculations of 3 mg. in guinea pigs and rabbits produced very slight, localized lesions in the form of small nodules which disappeared after 2 to 3 weeks. When 5 to 10 mg. were inoculated, edema developed on the following day. Within 10 to 12 days a small abscess appeared at the point of inoculation, breaking externally and suppurating from 2 to 4 weeks and then cicatrizing. The regional lymph nodes became enlarged but not caseous and soon they subsided to normal size. Excessive doses from 100 to 150 mg. after 2 to 4 weeks produced small granular follicles in the spleen, which disappeared in the course of 2 months. When suspected tissues were triturated and inoculated into a second series of animals no progressive disease was noted. However, very often when guinea pigs were inoculated with

doses of 50 mg. or more, many became emaciated and died. Many tuberculous-like changes were present in the viscera but these authors claim that the changes were due to pseudotuberculosis, from which *Bacillus pseudotuberculosis rodentium* was isolated.

Intraperitoneal inoculations of small doses were very well tolerated. Three mg. produced nodular reactions in the omentum. Later these nodules increased in size and persisted for 6 months and then completely disappeared.

Intracardiac and intravenous inoculations of 1 to 10 mg. had no ill effects in guinea pigs and rabbits. In about 15 days the lymph nodes at the groins became swollen and remained so for 10 days. This swelling completely disappeared in a few months. In the animals killed at the height of this reaction, the liver, spleen and lungs usually showed follicular lesions which were visible to the naked eye.

Administration per os was well tolerated, even in doses up to 100 mg. After 2 to 3 weeks following the feeding there was a general glandular enlargement, especially in the mesenteric lymph nodes. If the animals were killed during this period, small follicular lesions were found in the viscera and the tracheo-bronchial lymph nodes contained many acid-fast bacilli. All these lesions showed no tendency to progress, and gradually disappeared.

Direct intrapulmonary inoculations of 10 mg. of B.C.G. in half of the animals formed small, deep-seated abscesses. These abscesses were well borne by the animal and never culminated in death unless a superinfection of Pasteurella organisms occurred. In animals which survived 8 months the abscesses containing many acid-fast organisms were still present. In no instance were these authors able to transfer the suspected tuberculous lesions into a second series of animals, nor to increase the virulence of the organism.

Remlinger and Bailly,[21] Kühn,[22] Tzekhnovitzer,[23] Gentili, Gerosa, Mangiarotti, Nai, Setti, Zotini and Bassi,[24] Okell and Parish,[25] and others have confirmed Calmette's observations. However, there is a group of investigators including R. Kraus,[26] Selter and Blumenberg,[27] Gerlach,[28] Nobel,[29] Chiari, Nobel and Sole,[40] who have been able to produce lesions in guinea pigs and in some instances progressive disease leading to the death of the animal.

The organism is non-pathogenic for monkeys according to Wilbert,[41] who inoculated a number of chimpanzees, baboons and other types of monkeys. All tolerated very well even 100 mg., per os or intravenously. Subcutaneous inoculation produced slight edema with persistence of painless induration. Animals dying from intercurrent disease showed no evidence of tuberculosis.

OCCURRENCE OF TUBERCULIN REACTION IN ANIMAL EXPERIMENTATION

The development of the tuberculin reaction depends on the mode of inoculation. By ingestion a small number of animals become allergic. The same has been the result by the intravenous route. Nélis [42] states that tuberculin skin hypersensitiveness appears in adult guinea pigs between the 1st and 2d months and lasts from 6 to 10 months after ingestion of B.C.G.

Tzekhnovitzer [23] claims that guinea pigs become hypersensitive to tuberculin after treatment with B.C.G., the highest intensity occurring from 2 to 4 months. Seventy per cent of those infected orally and 45 per cent of those infected by the subcutaneous route react. The intraperitoneal and intracutaneous inoculations apparently do not sensitize animals to tuberculin. Rabbits do not react very readily to tuberculin after treatment with B.C.G. organisms. The ophthalmic reaction, however, is positive in 100 per cent of all animals.

Bruno Lange [43] obtained positive reactions to tuberculin in 100 per cent of guinea pigs inoculated intravenously, in 80 per cent of those inoculated orally and in 62 per cent after inhalation.

In regard to phagocytosis, Metalnikov and Secreteva [44] noticed that the cellular reaction is very similar to that observed in animals infected with virulent organisms.

II. IMMUNITY IN ANIMALS VACCINATED WITH B.C.G.

Calmette [20] and his coworkers claim that intravenous inoculation of 25 to 30 mg. of the organism in a fine suspension will protect rabbits against 0.001 mg. bovine bacilli which kills controls in 75 days. This resistance began to diminish in about 6 months, after which the lesions due to the virulent bovine infection progressed very rapidly, causing the death of the animal. Subcutaneous and intraperitoneal sensitization was not very effective. Rabbits of 15 to 20 days of age when sensitized by the buccal route by making them ingest organisms dropped with a pipette, resisted subsequent infection of a virulent organism very much like those vaccinated intravenously. If they were inoculated 3 months after the B.C.G. vaccination with a virulent bovine culture, the sensitized animals outlived the controls by 6 months and at autopsy only discrete lesions could be seen.

Guinea pigs were not so suitable for immunization for the reason that they are extremely susceptible to intercurrent infection. The adult guinea pig, following a single intracardiac inoculation of 5 to 10 mg. or by two subcutaneous inoculations of 50 mg. at 2 months-interval, shows considerable resistance to an infecting dose of 0.001 mg. Or still better,[45] if very young guinea pigs of 8 to 20 days of age are

given ten feedings of 100 to 150 mg. of the organism with a pipette at 20 hours-intervals, they will resist 0.001 mg. of a virulent culture. The infecting dose may be given either by intraocular instillation of a drop of fine emulsion or may be fed to young guinea pigs. In both instances, according to these authors, the results are very satisfactory.

Guérin, Richart and Bossière [4] studied a large number of cattle on a farm where the latter were raised for the production of butter. On this farm in 1915, in a herd of 67 head, 47 per cent reacted positively to the tuberculin test. Year after year the reactors were slaughtered. This procedure was not effective in completely eradicating tuberculosis from the farm. In 1919, 38 per cent were still positive to the tuberculin test. In 1920, the number of reactors was increased to 41.7 per cent. Vaccination in the new-born cattle started January 1, 1921. No special precaution, according to the authors, was taken to eliminate the possibility of contamination. In 1922, one year after the vaccination, 20 cattle gave a definitely positive and 9 a very suspicious tuberculin reaction, or a total of 45 per cent of 64 head. Many of those animals were vaccinated and revaccinated. In 1923, there remained 26 of the 1919-20-year animals, all giving a positive tuberculin reaction. In 1924 only 5 reactors were allowed to live with the young vaccinated animals. In 1925, only 2 remained of the original 1919 animals, 3 having been killed. In 1 of the 3 reactors killed, no tuberculosis could be found, in the 2d there were only few tubercles in the lungs, and in the 3rd animal there was an old calcified lesion in the lungs. In 1926, 7 years from the beginning of the experiment, there were still 2 of the infected animals which were reported in the 1919 experiment and which gave a positive reaction to tuberculin.

In the meantime, the second generation of these vaccinated animals were revaccinated and the vaccination repeated each following year. At the time of their report, the group of vaccinated animals consisted of 58 cattle living in contaminated surroundings. There is no record of how many of the vaccinated cattle became infected, as the tuberculin test was not done. These authors omitted the tuberculin test on Calmette's suggestion, as he believes that it is of doubtful diagnostic value, giving no information as far as exogenous infection is concerned. Furthermore, if in the vaccinated cattle an implantation of a virulent organism has taken place, setting up only a benign tuberculosis, tuberculin administered may bring about a violent allergic reaction, disseminating the virulent organisms. In such an event a progressive disease may follow. The validity of the claims for establishing protection in the vaccinated animals was based on autopsies done on a few cattle which have died from intercurrent disease.

Tzekhnovitzer[20] concluded that B.C.G. given orally in young guinea pigs does not prevent oral infection with virulent organisms. The animals may live a little longer than controls but the lesions are very similar to those seen in the control animals. Rabbits vaccinated subcutaneously lived longer than the controls and the lesions were not of the progressive type. In cattle after intravenous immunization with B.C.G. followed by 5 mg. of virulent bovine culture, the controls died in 6 weeks of miliary tuberculosis, while the sensitized animals survived and appeared apparently normal. Two, killed after 3 months, showed nodular tuberculosis. Two, killed 6 months after the virulent inoculation, showed subpleural tubercles, calcified bronchial and mesenteric lymph nodes and a few tubercles in the lung. Another animal killed in the 9th month showed a number of tubercles in the lungs. The last animal killed in the 10th month showed a caseous mass in the left lung. All were apparently in good health when killed.

Watson,[47] in a limited number of cattle vaccinated with B.C.G., observed no conclusive evidence of protection. The animals were vaccinated with B.C.G. in the usual way, were kept away from contaminated surroundings for a short period, and then put in with a tuberculous herd, exposing them to natural infection. The animals in the group were killed at various intervals from 2 to 24 months. All were free from tuberculosis.

A second series of animals were treated approximately the same as were the preceding series, kept under observation for 15 months and then killed. Progressive tuberculosis was found in every one of these vaccinated animals. The discrepancy in the two series is explained by the author in that the source of infection was different although the vaccinations were carried out exactly alike.

In a series of 4 unvaccinated new-born cattle which were put in contaminated surroundings and killed some 15 to 20 months later, only 1 of the animals had demonstrable tuberculosis. The author concludes that a large series must be employed and that animals with no natural resistance must be chosen for experiments of this nature. He calls attention to the possibility that the virulence of the organism which causes the infection in a herd may fluctuate from time to time. Tuberculosis may spread very slowly in one herd and very rapidly in another. This variation may be due to the natural resistance which some of the herds possess, the organism causing no clinical manifestation even with its continuous presence. Gradually the animals become resistant to this particular organism. However, as soon as a new organism is introduced into the herd, the occurrence of the disease is much more marked than previously.

Wilbert [24] reported a study of 15 chimpanzees and 59 Pithecians in East Africa, which if it can be repeated will strengthen the status of the B.C.G. vaccination. Monkeys of all ages were vaccinated either by a single subcutaneous inoculation of 50 mg. or by five ingestions, each consisting of 15 mg. at intervals of 8 to 10 days, and all showed resistance when exposed to natural contact infection. Some of the monkeys have been under observation since 1924 and were still living and in good health at the time of writing. The life of controls and of infected animals has always been very short. Autopsies on many of the vaccinated chimpanzees which have died from intercurrent diseases showed no tubercular lesion. This author concludes that B.C.G. can establish a definite protection in monkeys.

PREPARATION OF VACCINE AND METHOD APPLIED IN INFANTS

The organism ordinarily is cultivated on glycerin potato bile medium. When a large quantity is desired, especially in the vaccine preparation, it is advisable to cultivate it on a synthetic medium known as "Sauton's." Surface inoculation is made by floating the seed and an abundant growth accumulates in a short time. Only cultures of 3 weeks' development are recommended by the author for the preparation of the vaccine. The fluid medium is removed from this 3 weeks' growth, and a number of sterile glass beads are introduced. The flask is fastened to a shaking machine and after 15 minutes of vigorous shaking it is diluted with a mixture containing 1 per cent dextrose and 4 per cent glycerol in water. The whole mass is well mixed and allowed to stand until the clumps settle. The supernatant suspension of living organisms is then diluted so that 1 c.c. represents 5 mg. moist weight of the bacilli. Two c.c. of this suspension are mixed with milk and fed to infants. The feedings are made on the 3rd, 5th and 7th days after birth. Each feeding represents approximately 400,000,000 of living organisms.

The history of the vaccination of infants with B.C.G. as a prophylactic measure dates from July, 1921, when Turpin and Weill-Hallé fed some infants at the Maternity Hospital in Paris. For the following 2 years the vaccination was practically neglected. It was not taken up seriously until July 1, 1924. In a recent article Calmette [25] and his coworkers tabulate the results from the 3 years' vaccination of 52,772 children, which cover a period from July, 1924, to December 1, 1927. Eight hundred and forty infants were vaccinated in 1924; 4,336 in 1925; 14,654 in 1926; and 32,942 in 1927. Sixty-two hundred and nineteen of the vaccinated were born in tuberculous families, 5,749 of whom have been under observation for 1 to 3½ years. Of these, 3,808

were vaccinated less than 1 year, 118 of whom died, making a general mortality of 3.1 per cent and a tuberculous mortality of 34 infants or 0.9 per cent. Tuberculous meningitis is given as the cause of death in 30 cases or 88.4 per cent of the tuberculous deaths. The remaining deaths were due to some other form of tuberculosis. Of the 84 infants in this group who died from other causes than tuberculosis, 29 or 34.5 per cent died from gastroenteritis.

The remaining 1,941 of these 5,749 infants represent a group from 1 year to 3½ years of age. Twenty-one deaths occurred in this group, or a general mortality of 1.2 per cent, 4 of whom, 0.2 per cent, died from tuberculosis.

In a third group of 917 children from 2 to 3½ years of age there was no tuberculous mortality. It is not quite clear if the third group is included in the second group.

Perhaps the best controlled study on infant vaccination is that made by Weill-Hallé and Turpin.[45] Their statistics consist of 469 cases vaccinated with B.C.G., 92 of whom they lost track of and could not include in their study. Another group of 60 was excluded because the duration of time after the vaccination was too short. Of the whole group they analyzed only 317 cases which were well followed with the intracutaneous skin test. Death occurred in 14 of these 317 infants. Two hundred and thirty-six were from healthy surroundings and 67 from tuberculous environment. The 14 deaths were equally divided between the two groups, 7 in the first and 7 in the second. The skin test was done approximately every 3 months, and the results are tabulated in the following table:

	Intracutaneous Skin Test	
	Infants Vaccinated, Living in Tuberculous Surroundings	Infants Vaccinated, Living in Healthy Surroundings
Age in Months	Tuberculin Skin Test Positive in Per Cent	Tuberculin Skin Test Positive in Per Cent
3	11.1	2.5
6	16.6	4.1
9	25.9	5.8
12	26.6	7.6
15	44.4	7.4
18	50.0	12.1
24	60.0	28.0

A glance at this table shows that the tuberculin skin reaction was positive more frequently in the group of children who were in tuberculous surroundings than in the group in which apparently there was no source of infection. The tuberculin skin reaction does not give us any information, especially in the group vaccinated and living in healthy surroundings, as to whether the infection was due to B.C.G. or to an exogenous source. Sixty per cent of children at the age of 2

years living in contaminated surroundings have reacted positively to tuberculin. This probably means that a large percentage of infection in this group was of exogenous character. It does not vary in any way from the group of children who have never been vaccinated and have lived in tuberculous surroundings. It seems that in spite of the vaccination with B.C.G. and the sociological measures, the implantation with virulent tubercle bacilli has taken place.

Selter,[49] analyzing these figures, offers the same criticism. It would be interesting for this author to follow not only the children brought up in surroundings where the possibility of infection is great, but also in the second group which give no history of infection.

Sayé, Domingo and Miralbell,[50] using Calmette's method, vaccinated 203 children with B.C.G. Six deaths from tuberculosis occurred among the vaccinated, or approximately 3 per cent. A number of the infants died from gastroenteritis but unfortunately no record is given as to the nature of this gastroenteritis.

Moine [51] in a study of 882 infants reports a mortality from tuberculosis in only 0.8 per cent. Biraud [52] reports 2.46 per cent mortality from tuberculosis in a group of 1872 vaccinated infants. Ott [53] gives a mortality of 1.9 per cent from tuberculosis in 157 infants. Rougebief,[54] following 60 cases of 623 vaccinated infants in Algeria gives no mortality from tuberculosis. Blanc,[55] in Greece, reports no mortality from tuberculosis in 136 infants vaccinated. Cantacuzène [56] reports no tuberculosis mortality in 578 infants. Keller [57] also reports good results but he believes that living B.C.G. vaccination should be controlled with killed organisms. Bernard [58] had no accident in 20,000 children vaccinated in Indo-China. Malvoz and Van Beneden,[59] in Belgium, report only 1 death from tuberculosis in a group of 374 vaccinated infants, and Iakhnis,[60] of Lithuania, studying 472 vaccinated infants, reports that he obtained ten times more positive tuberculin reactions in the vaccinated children than in the unvaccinated. He has noticed no ill effects from the vaccination.

THE AUTHORS' STUDY ON THE BIOLOGICAL CHARACTERISTICS OF B.C.G. CULTURAL CHARACTERISTICS

Our study was based on cultures obtained from three different sources, one from Dr. Watson of Ottawa, Canada, another brought to us by Dr. Lawrason Brown from the Pasteur Institute, and the third was sent direct to us by Prof. Calmette.

The organism grows well on glycerinated bile potato medium. The single colonies are perfectly round and considerably moist. The growth appears from 15 days on, gradually increasing in size. In time the

glistening surface dries out, assuming a mat appearance. They are very easily emulsified and the suspension obtained is very similar to that obtained from the avian tubercle bacillus. The organism grows well on the surface of practically all fluid media used for the cultivation of the tubercle bacillus. Sauton's medium, recommended by Calmette, is very suitable for obtaining a large amount of growth. The filtrate after the 3rd week develops very strong tuberculin. Guinea pigs inoculated with the organisms develop skin hypersensitiveness in about 15 days.

The first culture studied was that obtained from Dr. Watson. Eight guinea pigs were inoculated subcutaneously, the amount varying from 2 to 16 mg. Two guinea pigs received 2 mg.; 2, 4mg.; 2, 8 mg.; and 2, 16 mg. Sixty-one days after the inoculation 1 animal from each group was killed and tuberculosis of the viscera was present. The other 4 animals were allowed to live. Five months from the beginning of the experiment, 1 of the animals which was inoculated with 4 mg. died and the cause of death was recorded as generalized tuberculosis. In the 6th month the animal receiving 16 mg. also died from generalized tuberculosis. At the 7th month the 2 remaining animals, i.e., 1 receiving 2 mg. and 1, 8 mg., were killed. At autopsy no evidence of tuberculosis could be found. At that time we could not explain the discrepancy observed in these animals, 2 having died from tuberculosis, while the other 2 living 7 months were free from tuberculosis. The experiment was suspended for a short time until we obtained another culture.

With the second culture an attempt was made to increase the virulence by rapid animal passage. The technic consisted in inoculating from 1 to 2½ mg. into the right testicle of 2 guinea pigs. After 7 to 14 days the infected testicles were removed aseptically under anaesthesia. The tissues were triturated and reinoculated into the right testicle of 2 other animals. Four such series were done. Three gave negative results after the 3rd, 4th and 5th passages. There was only localized tuberculosis which eventually healed. In one series, however, on killing the animal of the second passage, there was generalized tuberculosis of the viscera, and the spleen was large and nodular. The lymph nodes were very caseous. This caseous material was inoculated in the other guinea pigs and invariably generalized tuberculosis developed and death occurred.

During the cultivation of B.C.G. on fluid media a difference in the character of the growths appeared in some of the flasks. Some were veil-like with small islands of dense growth scattered throughout, while in others the growth was heavy and of uniform structure. This imme-

diately suggested to us the possibility of variants similar to those observed in the reproduction of other acid-fast organisms, and if B.C.G. could be dissociated, at least we could explain some of the discrepancies observed in animal inoculations.

A small amount of the third culture received directly from Calmette was triturated in salt solution with a pH of 7.8, filtered through two layers of Whatman paper No. 5 and 5 drops of the filtrate smeared over the surface of gentian-violet plates. After 6 weeks there appeared two distinct types of colonies. One, which predominated, was waxy, with smooth wrinkles, the folds of which extended from the center to the periphery. The outline was clear-cut, round, raised, and did not extend into the medium. This colony was very difficult to emulsify in salt solution of pH 7.2. We shall call this the "R" colony. The other colony, which we shall refer to as "S," was small, in irregular wrinkles on the surface and was not as smooth and waxy as the "R" colony. The outline was irregular and at times extended into the medium. This colony was much more readily emulsified.

On synthetic fluid media the "R" colony grows in the form of small islands or peninsulas and the growth is readily broken up and lifted with the loop. On the same media the "S" colony grows more tenaciously and in a solid mass very much like a thin veil. In attempting to remove a small amount of the surface growth, practically the whole surface is lifted. Both of these colonies produce tuberculin. Inoculated into guinea pigs, both set up a hypersensitive state to tuberculin. The complement fixing and precipitin antibodies can be demonstrated in rabbits following intravenous inoculations.

A comprehensive study of the biology of the "R" and "S" colonies, with special reference to virulence and immunity, will appear in the near future. All the work so far points out that the two colonies dissociated from the original Calmette strain behave differently, not only in regard to cultural characteristics, but also in virulence for guinea pigs and rabbits. The "R" colony always produces some tubercles which in time heal, while the "S" colony invariably produces progressive disease terminating in the death of the guinea pig. The chemistry of the two colonies is also different.

IMMUNITY EXPERIMENT

The value of B.C.G. vaccination was tried in a limited number of animals and the experiment is not yet completed. The experiment consisted of 38 vaccinated and 26 control guinea pigs. They were divided into four groups.

Group I consisted of 8 very young guinea pigs not older than 36

hours. They were fed with an emulsion of B.C.G. bacillus, four doses of 0.8 mg. being given, a total amount of 3.2 mg. dry weight or approximately 20 mg. moist weight as used by the French investigators. Four and one-half months later 3 drops of a suspension of living virulent culture consisting of 100,000,000 organisms per c.c. were instilled in the eye. Seven controls were infected by the same method. Eight months after the instillation with living tubercle bacilli, in the vaccinated animals, 3 are still living and 5 have died between the 130th and 231st days. Three unquestionably died of tuberculosis. One died from pneumonia complicated with tuberculosis, and in the other which died from a chronic otitis the cervical lymph nodes were enlarged and contained acid-fast organisms. Of the control animals 5 are living and 2 have died. Death in 1 of the animals was due to tuberculosis and in the other to chronic otitis with some tuberculous involvement.

The second group consisted of 8 sensitized animals and 9 controls. In this group also very young guinea pigs not older than 36 hours were used. They were inoculated subcutaneously with a suspension of B.C.G. of 0.25 mg. every 5th day. Four doses were given, a total amount of 1 mg. dry weight or 8 mg. moist weight. The vaccinated and the control animals were then infected by the inhalation method with H 37. At the end of the 8th month, 1 of the vaccinated animals is living and 7 are dead. Four died of extensive tuberculosis, 1 of cellulitis with some tubercular lesions and in 1 the cause of death was undetermined but there were tubercle bacilli at the site of inoculation. The 7th animal died of postpartum peritonitis with considerable amount of tuberculous involvement. Six control animals died of generalized tuberculosis.

The third group consisted of 10 full grown guinea pigs. Four inoculations were made subcutaneously from 2 to 3 days apart. A total amount of 12 mg. of moist weight of the organisms was given. The infecting dose was given subcutaneously a month later, consisting of 500 organisms of H 37. One year later 3 of the animals are still living and 7 are dead. Five which lived more than 279 days died of generalized tuberculosis. One living 98 days died with chronic sinusitis with no macroscopic evidence of tuberculosis. In another animal which also died with sinusitis on the 102nd day there was tuberculosis in the spleen and lymph nodes.

The fourth group consisted of 12 adult guinea pigs. Vaccinations were made intraperitoneally and four doses were given between 2 and 3 days interval, or a total amount of 12 mg. moist weight. A month later they were inoculated subcutaneously with 500 virulent H 37 organisms. One year later 4 of these 12 animals are still living and 8

have died from various causes. Two died shortly after the inoculation and have been excluded from this group as death occurred too soon after infection. One died on the 79th day from gastroenteritis with no evidence of tuberculosis. Another died on the 95th day with chronic otitis and no tuberculosis. Three others died on the 123rd, 238th and 279th days of generalized tuberculosis. In 1 animal dying on the 264th day the cause of death was due to strangulated gut and tuberculosis was present in the spleen and lymph nodes.

Ten controls were used for Groups III and IV. They were inoculated also with 500 tubercle bacilli of the same origin. A year later 1 is living and 9 are dead. One died on the 97th day with chronic otitis with demonstrable tuberculosis in the spleen, one on the 100th day of peritonitis and no tuberculosis, and 1 on the 251st day of pneumonia with tuberculosis of the spleen. The remaining 6 guinea pigs died of generalized tuberculosis, some living as long as 351 days.

DISCUSSION

In the preceding pages an attempt has been made to bring together some of the outstanding features concerning the method of B.C.G. vaccination. The organism in question was isolated some fifteen years ago or more from a heifer. At the time of isolation it was pathogenic for cattle, rabbits and guinea pigs. By cultivating it in glycerinated ox bile potato during this period, it has almost completely lost its virulence, but has maintained the property of forming localized tubercles, of producing tuberculin, of rendering inoculated animals skin hypersensitive, of producing the formation of specific antibodies and according to the sponsors of producing an immunity against virulent reinfection.

According to the majority of workers, B.C.G. is innocuous for small laboratory animals, lesions once established having a tendency to heal. The experiments of Gerlach,[35] Nobel,[39] Kraus,[38] Selter,[37] and others are not, however, in agreement as to the innocuousness of the organism. Some of them have been able to establish progressive disease in guinea pigs, eventually leading to death, and Nobel and Gerlach were able to pass the lesions from animal to animal. Korschun [61] has been able to increase the virulence of B.C.G. in animals by treating them first with diphtheria toxin.

In two instances we have been able to demonstrate generalized tuberculosis by direct inoculation and in one other instance tuberculosis was established after the second animal passage. In defending their position Calmette and his collaborators state that any positive tuberculosis in animals when inoculated with B.C.G. is due to a con-

tamination with a virulent tubercle bacillus. Accusing any trained worker of carelessness in contaminating cultures is not a justifiable criticism.

An explanation of these discrepancies reported on the virulence of this organism is offered by the recent work on dissociation which has been observed in the majority of bacterial species.

Recently we [28] have observed that any culture of tubercle bacillus may contain two types of colonies which can be differentiated by their cultural characteristics and virulence for animals. We have found two types of colonies present in a culture of B.C.G., one "R" colony (rough) * which is non virulent, and the other "S" (smooth) * which is virulent for guinea pigs. The "R" colony grows very well on glycerin bile potato and Sauton's media, while the "S" does not produce any visible growth in bile but grows in Sauton's.† The latter, however, does not die in the bile medium. Scrapings made from the surface of the inoculated culture 1 and 2 months after incubation invariably produce progressive tuberculosis in guinea pigs, involving the lymph nodes and the viscera. The lesions are similar to those seen in guinea pigs inoculated with bovine tubercle bacilli. These scrapings will also yield a profuse growth after cultivation on suitable egg media. From the lesions of this "S" colony we believe that B.C.G. has still the ear mark of a bovine organism but lacks the power of producing progressive tuberculous lesions in rabbits. By continuous subculturing on potato bile media, Calmette has gradually eliminated most of the "S" colony, allowing the "R" to predominate. The virulent "S" colony, however, has never been completely eliminated, and although present in very small numbers, under favorable conditions it may increase in number to such an extent that reversibility of virulence may take place. An observation of this nature is not uncommon with any other bacteria. It cannot be thought that the tubercle bacillus is an exception.

The animal experiments submitted as the basis of vaccination with B.C.G. are unsatisfactory. There is, at most, only weak evidence to show that this organism establishes any appreciable degree of protection in small laboratory animals. The only evidence being that some of the vaccinated animals outlived the controls. Selter [37] believes that some degree of protection can be established, but this is due to the slight degree of virulence still present in the organism. We are inclined to believe that the protection conferred by B.C.G. is very slight and not greater than that obtained with heat-killed organisms where there

* The nomenclature is arbitrary. They are both rough but have a different structure.

† In a recent paper we have been misquoted by Calmette.[38]

can be no question of danger. The life cycle of the tubercle bacillus is not completely understood and especially of the B.C.G. We consider its use, at least for the present, should be deferred. After the accumulation of more experimental data we may be brought to modify our position.

We cannot completely ignore the autopsy findings of Taillens,[64] Girod and Debarge[65] in infants who had been vaccinated, nor the tuberculin reaction observed by Weill-Hallé,[66] where there was evidence that B.C.G. produces some tuberculous changes in vaccinated infants living in healthy surroundings. The mere fact that 28 per cent of infants vaccinated and living in healthy surroundings reacted to the intracutaneous tuberculin skin test forces us to such a conclusion. It will be interesting to know if any of these infants develop clinical tuberculosis later in life. Of course if such occurrence takes place, there are no means for determining whether the disease is due to B.C.G. or to some exogenous infection.

Further, in regard to the immunity in cattle, the results reported by Guérin, etc., have not been universally accepted by men who have studied this problem in cattle. Watson,[67] of Ottawa, states that tuberculosis may spread very slowly in one herd and again very rapidly in others and he believes the resistance existing in the former is due to the persistence of the tubercle bacillus in the animal body for many years, causing no clinical disease under normal conditions. If, however, some of the infected but not ill animals were put in with a stock free from tuberculosis, they may infect fatally many cattle of the second herd, the original infected lot outliving the second lot. This author also believes that very little could be gained by vaccinating calves, and even if the vaccinated animals were more resistant to superinfection than the unvaccinated, the former could not completely resist an implantation of a virulent organism. After such implantation takes place, the organism in all probability will be localized in the lymph nodes and remain there for a long time doing no damage, but after years of strenuous milk production the animal's resistance may diminish to a point where disease begins to develop.

Calmette's original cattle experiments in 1913[68] are also open to criticism. He only uses 1 control in each group with 7 or 8 vaccinated animals. The statement is made that 3 mg. of the Vallée bovine strain invariably killed the control in 5 weeks of generalized tuberculosis, while the vaccinated continued in good health. Watson, however, using the same Vallée strain observed that some control calves which had been inoculated intravenously with 250 mg. of the organism and killed 11 months later showed only lymphatic tuberculosis. Did Calmette

use identical suspensions in his control in each experiment, or did he assume from previous experiments that the Vallée strain always killed in this dose? We now know that unless we cultivate our human H 37 and bovine B 1 tubercle bacilli on suitable media the virulence diminishes. For this reason when testing the resistance of vaccinated animals the same number of controls must always be used.

Uhlenhuth [*] is inclined to believe that the cattle experiments reported by Calmette where infection was by contact were not carried out as they should have been. The heads of the animals were turned toward the wall, thus preventing the droplet infection. At least the certainty of natural infection was lessened.

We suggest that the success reported by Guérin in cattle experiments was not due to the protection established by vaccination with B.C.G., but to the elimination of the contaminators on the one hand, and to the development of natural resistance on the other. This point seems obvious in the animals killed 7 years after they have reacted positively to tuberculin, the autopsies revealing only few small lesions.

The favorable reports coming from Europe on the vaccination of new-born babies are so amplified that they have reached the point of distortion. Careful analysis of the statistics submitted reveal one outstanding fault, viz., that not a single group of vaccinations has been controlled. We have failed so far to find comparable figures which may lead us to some conclusion. Mortality rates from tuberculosis in infants, in one instance, are quoted as far back as 1889. Have not the conditions and our knowledge of sociological measures been improved in recent years so as to bring the mortality to a lower level? Calmette claims that in France he has reduced the mortality from tuberculosis in the first year of life from 25 per cent before the vaccination to 0.9 per cent after the vaccination. Does this 25 per cent mortality in infants in tuberculous families refer to the group of known infected as detected by the positive tuberculin reaction, or does it represent a percentage from the general mortality? It is not quite clear in our minds.

It must be remembered that most of the vaccinated children born of tuberculous mothers were removed from contact for at least 4 months, thus decreasing the possibility of an infection in this early period of life. This isolation gives the infants an opportunity to adjust the normal mechanism of defense against any infection. No infants in France without vaccination have been submitted to a similar preventive measure early in life. How then can we compare the two groups, the vaccinated and the unvaccinated? Two factors are involved in these studies, vaccination and hygienic preventive measure.

Further, how can we determine the cause of death in infants from tuberculosis without post-mortem examination? There are other forms of tuberculosis in infants besides tuberculous meningitis which are not easily diagnosed. Calmette presents only 3 autopsies, involving a study of several hundred deaths. Many of the vaccinated infants have died of gastroenteritis; in fact, over 30 per cent of the deaths occurring in the vaccinated infants not due to tuberculosis have been recorded as gastroenteritis. Could it not be possible that in some this gastroenteritis was of a tuberculous nature? While it is probable that the organism, by feeding, may find its way into the mesenteric lymph nodes and then be distributed throughout the body, it is conceivable that when such large doses are administered at birth the mucosa may become involved directly. The innocuousness of the organism has been based on the observation that no fatalities have been reported after oral vaccination. Fortunately, contrary to Calmette, the experimental evidence is against any great danger of infection taking place by this route. Findel,[66] Reichenbach,[67] Selter,[68] Brown, Petroff and Pesquera [69] could not readily infect guinea pigs by feeding. The only misgiving we have is that some virulent type (S) may be carried along with the non-virulent.

Weill-Hallé observed only 2 per cent positive tuberculin reactions up to 3 months in a group of infants vaccinated by the oral route and living in healthy surroundings. When the vaccine was administered subcutaneously 100 per cent of the infants reacted intracutaneously to tuberculin. Is this not sufficient proof that very few of the organisms pass through the intestines of the infants?

In explaining the 0.9 per cent mortality from tuberculosis in infants vaccinated with B.C.G., Calmette [28] and Surrez [70] do not, as a rule, attribute it to an infection of exogenous character subsequent to vaccination. They profess to believe that tuberculosis occurred in these infants usually as a result of fetal infection with the ultra-microscopic filtrable form of the tubercle bacillus which traversed the placenta, a theory which is still a speculation. In our laboratory we have not yet confirmed the existence of a Berkefeld filtrable form of the tubercle bacillus.

We are further told not to worry about the B.C.G. because it is a bovine organism which is not virulent for human beings; but is it not a false security to depend upon its presence for protection without any knowledge of what immunity, if any, it confers? Infection with the bovine tubercle bacillus in infancy is today a rare occurrence; but what becomes of this organism after puberty in those that have been infected? Does the bovine organism transmute into the human

tubercle bacillus after inhabiting the body for a long time? All evidence up to the present is against such transmutation, but we must not be too dogmatic in completely ignoring its possibility.

The differentiation of the human and bovine cultures has been based on the ability of the organism to produce progressive disease in a rabbit. If a culture inoculated in dosage of 0.01 mg. infected the rabbit and death followed in 60 days, then the organism was bovine, and if it did not, it was human. This holds true probably with the two extreme types; but how about the intermediate ones? If B.C.G. was a bovine tubercle bacillus at the time of isolation, it must possess all conventional biological characteristics, i.e., it must be virulent for rabbits, cattle and guinea pigs and give the alkaline curve on broth as described by Theobald Smith. The dissociated "S" virulent colony of this organism infects only guinea pigs at present with a marked lymphatic involvement comparable to many other bovine tubercle bacilli, is no longer pathogenic in small dosage for rabbits, and the acid base curve is that seen in the human organism. In other words, the organism has some human and some bovine characteristics. Mudd [21] also points out that B.C.G. behaves like the human strains studied in his interfacial experiments.

The main object of the present campaign in prophylactic immunization has been to reduce the mortality from tuberculosis during the first year of life. Vaccination with living organisms has been suggested and very extensively used. There is evidence that the general mortality has been reduced and there are indications that some of the infants have been infected, while others, regardless of the prophylactic measures and vaccination, have been reinfected with small numbers of virulent organisms.

It seems advisable and a much safer procedure not to introduce another living organism into the body but rather, by hygienic measures, to eliminate as much as possible the danger of excessive infection from the new-born babies. Such preventive measures are effective, as was pointed out by Grancher some twenty-five years ago, and more recently, Debré and Lelong [22] and others have been able to prevent infection in infants by removing them from their tuberculous mothers. König,[23] studying the mortality in Prussia, states that in 1925 the general mortality among 246,488 infants under sanitary supervision was reduced from 12 to 5.5 per cent. Among them there were 188 male infants living in tuberculous surroundings of whom only 6.3 per cent reacted positively to tuberculin and 140 females of whom only 5.7 per cent reacted. These remarkable figures have been obtained not by B.C.G. vaccination but by educational and preventive measures.

In the United States and Canada where the campaign against tuberculosis is made very effective by the use of various sociological and health measures, mortality and infection in childhood have decreased to a very low level and we cannot see why such a prophylactic measure as advocated by the French investigators should be introduced at present. We may recall that Friedmann's vaccine which was condemned in 1912 was also a living organism, and the potential virulence of it was probably of lower degree than B.C.G. We believe that watchful waiting is the best position at present in reference to vaccination of infants. We cannot completely ignore the possibility of a prophylactic vaccination method and the one advocated demands our careful consideration. The careless use of poor statistics obtained from a study of human beings is going to lead us nowhere.* Therefore, we strongly advocate experiments in cattle on a large scale in order to confirm or refute Calmette's claims.

* The reader is referred to a comprehensive analysis of Professor Calmette's statistics by Dr. M. Greenwood in the *British Medical Journal* of May 12, 1928.

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Institute for the Protection of Child Health in Soviet Russia

BY government decree there was recently established in Moscow the Government Scientific Institute for the Care of Child Health. The institute, which is doing theoretical as well as practical work, has the following purposes:

1. Study of the physical and psychological nature of normal and abnormal children between the ages of 4 and 17 years.

2. Study of methods for the prevention and treatment of physical and mental disorders in children of these ages.

3. Training of workers for the care of the health of children and young people.

The institute consists of the following four divisions: division of the normal child, division of the physically abnormal child, division of mental and nervous disorders, and the statistical division. A separate section will be devoted to the training of physicians as specialists in child health work.

The following auxiliary agencies are connected with the institute: an experimental dietetic dining room; a clinic for normal children, one for physically defective and one for mentally defective children; a sanatorium, a playground conducted on the principles of physical therapy; a diagnostic clinic, and a museum. The institute is coöperating with other organizations interested in child health.—*Voprosi Zdravoo Khranenia*, Moscow, 1:74, 1928; 4: 81. 1928.

Refugees gathered at Santa Paula immediately after the flood, lined up for typhoid immunization

Sanitation in the St. Francis Dam Disaster*

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THE St. Francis dam in San Francisquito Canyon of Los Angeles County, impounding more than 12 billion gallons of water, broke about midnight of March 13, 1928. This dam, of concrete construction, had a maximum height of 205 feet, was 700 feet long, and was 175 feet thick at the base. It failed completely, with the exception of a small section near its middle, and the force of the flood water was so great that it broke the structure into great blocks of concrete up to about 10,000 tons in weight, distributing them for a distance of several thousand feet down stream. The flood waters attained a maximum depth of about 125 feet, and traveled, in a solid wall, down San Francisquito Canyon at the rate of 18 miles an hour. The flood followed this steep and narrow gorge for its length of 9 miles from the dam and then down the Santa Clara River 43½ miles to the ocean. It required about 5 hours for the enormous rush of water to travel the 52 miles from the dam to the Pacific Ocean. The Santa Clara River, like so many western streams, is practically an arroyo, containing water only intermittently during the rainy winter seasons. Practically the entire flow of this river is storm water and it is only during periods of heavy rains that it carries any stream whatsoever. It has a well defined channel, however, and the direction of the flood was determined to a certain degree by the topography of the dry bed. This immense volume of water, travelling at a terrific rate of speed, was hurtled from one

This huge block of concrete, 205 feet in height, the central section of the dam, was all that remained standing.

side of the Santa Clara River bed to the other, spreading out where the stream bed was flattened, piling up at its narrow confines, becoming dammed momentarily at bridges where debris had caught, and eventually carrying out all bridges, with the exception of one located not far from the Pacific Ocean.

The dry character of the stream bed and the comparatively short distance traveled by the flood, and its high rate of speed rendered the problems of sanitation far less acute than would have been the case with a flowing stream and a slow rising flood. The fact that there were no levees to break and that comparatively few towns or ranches were located immediately adjacent to the stream bed, made relief work and sanitation associated with the disaster far less arduous than in flood disasters in other parts of the country.

The town of Santa Paula, with a population of 7500, was the largest town involved. Santa Paula and Saticoy were the only towns in the flood which had municipal water supplies and sewage disposal plants. Most of the damage to property was done in Santa Paula and its vicinity. About 300 bodies were recovered, most of which were buried in debris. There are at least 200 missing, all of which are probably covered with many feet of silt. The bodies of individuals who were caught in the flood immediately below the dam were carried like corks on the crest of the flood, and many were recovered on the lower reaches of the Santa Clara River and even on the beach at the Pacific Ocean. Bodies of individuals who were caught in the flood waters farther down stream lodged in tangled masses of brush, trees and other debris or caught in groves of willow trees at the banks of the stream.

As soon as word of the disaster was received, representatives of the California State Department of Public Health left Los Angeles and San Francisco simultaneously. The first order issued by these officials upon their arrival in the flood area was that all milk supplies in the entire valley must be pasteurized. Immediately thereafter a regularly organized program was instituted and enforced through the coöperation of the local health officers, physicians, nurses, Red Cross workers, city and county officials, representatives of the Bureau of Light and Power of the City of Los Angeles, and a citizens committee of Santa Paula. The staff of the State Department of Public Health within the flooded area consisted of 2 epidemiologists, 1 district health officer, 1 physician specialist in child hygiene, 3 sanitary engineers, 4 sanitary inspectors and 2 public health nurses. The four main activities carried on by this staff were:

1. Safeguarding water supplies and sewage disposal plants
2. Safeguarding milk supplies
3. Offering immunization against typhoid fever to all individuals within the flooded area
4. Sanitary inspection of towns, ranches and the silt covered river bed

The Safeguarding of Water Supplies and Sewage Disposal Plants—The municipal sewage disposal systems at Santa Paula and Saticoy were washed over and it became necessary to provide emergency chlorination of the Santa Paula municipal septic tank effluent because of the impairment to the efficiency of the plant. Flood water entered the municipal water reservoir at Saticoy, making necessary the immediate disinfection of the water contained therein. Private and irrigation wells along the fringe of the flood, about 100 in number, located both above and below the Santa Paula sewer farm, were inspected and examined bacteriologically for contamination. Field equipment from the Los

Another view of the central section of the dam

Automobiles and wreckage partly buried in silt

Angeles city water department laboratory made possible the making of analyses in the field, speeding up this work immeasurably.

Safeguarding of Milk Supplies—Following the order, which provided for the immediate pasteurization of all milk supplies, the inspection and safeguarding of all such supplies were placed under the direction of the County Sanitation and Milk Inspector. No milk, other than pasteurized milk, was permitted to be used in any of the refugee camps which were in charge of local committees. Following the establishment of the safety of all water and milk supplies at dairies and the establishment of sanitation conditions, the distribution of milk under normal conditions was resumed.

Immunization against Typhoid Fever—Immunization against typhoid fever was offered to the inhabitants of the entire Santa Clara Valley. The representatives of the State Department of Public Health, in coöperation with local health officers, physicians and nurses, established clinics in the various communities: Santa Paula, Fillmore, Piru, Bardsdale and Saticoy, as well as other more isolated communities. A total of 3106 individuals in the flooded district were immunized against typhoid fever. Of these, 1080 were immunized by representatives of the State Department of Public Health, and 2026 were immunized by local health workers at Santa Paula. The state provided the vaccine for all immunizations. On March 23, first injections at immunization clinics were discontinued.

Sanitary Inspections—The work of the state sanitary inspectors, consisted of the cleaning of dairies, the inspection of homes rehabilitated following the recession of flood waters, the inspection of quarters

Temporary fly-tight toilets installed in the refugee camp at Santa Paula

provided for refugees and all labor camps, the proper disposal of carcasses of dead animals, the disinfection of open cesspools and vault toilets, the burning of debris, the inspection of vegetable truck gardens and similar activities.

RELIEF MEASURES

General relief measures were carried on under the direction of the Red Cross, the American Legion and other local organizations. Within a few hours after the recession of the flood waters provisions were made for housing homeless Mexicans in Santa Paula, of which there were between 300 and 400. Clothing was provided and breakfast was served to 168 families at 7 o'clock on the morning of the day of the flood. Hospitalization was provided for the relatively small number who needed such care. A tent city was established for the habitation of those rendered homeless on account of the flood. This community was constructed along sanitary lines and provided adequate temporary accommodations for the homeless. About 400 houses in Santa Paula, located in an area which comprised from 10 to 15 city blocks, were destroyed or so badly damaged that rebuilding was necessary.

As soon as the emergency conditions abated, the City of Los Angeles, which assumed full responsibility for the disaster, dispatched between 2,000 and 3,000 men to clean up, in military fashion, the entire Santa Clara River bed. Tractors and trucks were used to remove debris, in which were found automobiles, human bodies, dead horses and other animals. Most of the debris was moved to safe distances and burned. Arrangements were made by which all crews

working in the river bed were provided with portable toilets. Isolation tents were provided at all labor and refugee camps in order to provide temporary hospitalization facilities for those who became sick or were injured.

In order to coöperate more closely with the health officials, the Los Angeles Bureau of Light and Power appointed local physicians to care for the sick, and the contracting company which carried on this work appointed a sanitary inspector to visit and supervise sanitary conditions in all camps within the flooded area. The district affected by the flood lay entirely within Ventura County, excepting the upper part of the district, the sanitation of which was cared for in an able manner by the Los Angeles County Health Department.

The emergency in the St. Francis dam disaster and the flooding of the Santa Clara river bed constituted an acute emergency. The disaster was characterized by the comparatively high mortality and the short duration of disaster conditions. The work of sanitation was, as a result, completed quickly and a return to normal conditions was effected within a short time. Had the population in the Santa Clara River watershed been larger the loss of life would have been enormous, as there was little time for warning and small chance for escape. No cases of communicable diseases occurred as a result of flooded conditions. The excellent coöperation of local authorities and the City of Los Angeles, as well as that provided by citizens' committees, the American Red Cross, the American Legion, and others, aided materially in the prevention of the occurrence of communicable diseases and brought about the speedy return to normal conditions.

Stream bed of the Santa Clara River after the flood waters had passed. Many bodies of the dead were recovered in the debris which piled up against the willow trees shown in the background.

The Preventorium School

A Factor in the Community Tuberculosis Program

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THE Berkeley Sunshine School is an adaptation to the public school system of the preventorium régime. Its plan was inspired by a study of the following:

1. The inadequacies of the so-called open air school
2. The satisfactoriness of the Lymanhurst School of Minneapolis [1]
3. The need for preventorium régime of a larger number of children than were being reached
4. The necessity of modifying the school curriculum for the benefit of certain children with organic defects
5. The large number of school days lost by children who were convalescent from acute illness

This school has now been in successful operation in Berkeley for a year and a half. Results being obtained are therefore of interest.

Berkeley, with a school population of 15,000, was found to have continuously in the elementary schools between 100 and 150 children who were in need of preventorium régime, and another 25 to 50 who were in need of curriculum modification because of organic defect or prolonged convalescence from acute illness. Berkeley's quota of beds at the county preventorium was but 8, less than 5 per cent of the number needing this care. Admission to the preventorium was further restricted by limiting such admissions to persons unable to pay a private physician. The preventorium turnover of cases was very slow. Some children became sanatorium candidates before their turn came for preventorium admission. A study of 40 children discharged from the preventorium or sanatorium for 6 months or more showed the following conditions:

Readmitted to sanatorium or preventorium	9
On waiting list for readmission	10
Failing to improve	17
Showing steady improvement	4
Total	40

Further study of the 36 who failed to show steady improvement disclosed the fact that all were being subjected to greater physical strain than they could stand, and they were not receiving sufficient rest.

The Sunshine School was organized to care for children in the following groups:

Convalescents from acute illness

Children with or without known tuberculous infection in danger of developing tuberculous disease

Cardiacs needing increased rest, limited activity, and careful supervision of exercise

Children with other organic defects who would be benefitted by a rest régime

Children discharged from the preventorium or sanatorium who were still in need of increased rest and close medical supervision

For purposes of economy the school was housed in an elementary school building and made an administrative unit of that school. The capacity was limited to 40 children for the first year, and then expanded to 60 children. Space required is two dormitories, (converted classrooms), school cafeteria, (used by entire school), three classrooms, shower and dressing rooms, and a sun platform erected on the school grounds. The project was financed by the Berkeley Board of Education, the Berkeley Health Center, the Alameda County Tuberculosis Association, California Tuberculosis Association, Berkeley Exchange Club, and the Berkeley School Lunch Committee.

The total budget of the Sunshine School for the first year, covering cost of 40 children, is shown in Table I. This budget does not include any part of the overhead of the elementary school in which the Sunshine School is housed.

The maintenance cost per pupil-day at the Sunshine School, based upon figures for the year 1926-27, was 80 cents. This is 17 cents per day in excess of the cost per pupil-day in the regular elementary school in which it was housed. The saving over the per diem cost at any preventorium is apparent.

TABLE I

FIRST YEAR BUDGET OF SUNSHINE SCHOOL

Item	*Source of Income*		*Total Amount*
	Board of Education	Coöperating Agencies	
Original Equipment	$1,682.00	$1,496.95	$3,178.95
Maintenance	3,706.50	2,332.84	6,039.34
Total	$5,388.50	$3,829.79	$9,218.29

Staff of Health Workers—In addition to the usual school staff, the following persons carry out the health program under supervision of the Director of Health Education for the Berkeley Schools, who also holds the position of City Health Officer, and Medical Director of the Berkeley Health Center:

School Physician—The school physician is in charge of admissions, medical supervision and follow-up. He is also chief of pediatrics and

conducts the Sunshine School admission clinic at the health center.

Adviser in Tuberculosis—This worker also holds the position of superintendent of social service for the health center. She represents the medical director in health administration of the school.

Teachers—There are 3 teachers, who in addition to their teaching, supervise rest periods, and the lunch hour.

School Nurse—The school nurse is on duty at the school half time. She takes charge of sun and air treatments, and general health supervision under direction of the school physician. She also correlates the Sunshine School with the public health nursing staff of the city.

School Dietitian—She is in charge of the school cafeteria, and plans the menus.

Requirements for admission specify that applicants must be Berkeley residents, from the first 6 grades. Their financial status does not determine eligibility, this being determined by physical need.

They must be examined in the health center pediatrics department, where each case is worked up medically. Each child must be rendered free from any condition which will prevent improvement in the Sunshine School, and treatment is arranged through the family physician or in health center clinics.

In addition to medical findings, the health center social service department reports on home conditions, and determines the ability and willingness of the family to carry out the school program in the home.

Sun Treatment

Case work is done if there are social conditions which interfere with the patient's physical improvement.

The amount of school work is limited to 3 hours daily—time enough to cover only the essentials. This amount of time has enabled practically all children to keep up with their school grade.

School hours are from 8:45 a. m. to 4:00 p. m., and lunches must be eaten in the cafeteria under supervision. The following schedule is used:

8:45	Temperatures taken and inspection made by nurse for communicable diseases
9:00–10:00	School
10:00–11:00	Sun or air exposure
11:00–12:00	Rest hour
12:00	Temperatures taken
12:45– 1:00	Lunch
1:00– 2:00	Rest hour
2:00– 4:00	School

A mid-afternoon lunch of crackers and milk is served before the children go home.

Children are weighed once a week, and a complete record of weights, temperatures, sun exposure, and other medical data, is kept by the nurse, and is gone over each week by the school physician.

Further details of the medical régime have been described by Potter.[2]

RESULTS OBSERVED

Table II shows medical needs were met in 62 out of 79 children, or 73 per cent. This table also shows complete success to date with the group of ex-sanatorium and ex-preventorium children. For the entire group of convalescent, malnourished and tuberculosis observation cases, totalling 48, the Sunshine School régime was successful with 33, or approximately 70 per cent. In these percentages the number of

TABLE II

MEDICAL OUTCOME AFTER 3 SEMESTERS

Medical Problems	Medical Outcome: Improved sufficiently to be transferred to regular school	Improved but remaining in Sunshine School	Unimproved but remaining in Sunshine School	Unimproved and transferred to an institution	Discharged for poor coöperation	Total
Convalescent or malnourished	5	6	0	2	1	14
Tuberculosis observation cases	11	11	2	6	4	34
Cardiacs	0	3	0	1	1	5
Asthmatics	1	4	0	0	0	5
Ex-sanatorium or ex-preventorium children	12	9	0	0	0	21
Total	29	33	2	9	6	79

Rest Hour

children discharged for poor coöperation are considered treatment failures for the reason that coöperation might have been obtainable if the children had been removed from the home to a preventorium.

There is a marked reduction in the number on the preventorium waiting list. This has been reduced from 60 to less than 10.

An increased turnover is shown at the preventorium. Many children are discharged from the preventorium to the Sunshine School with satisfactory results.

There is a continued gain in children discharged from the preventorium, whereas, previously, many of these children showed retrogression.

A more effective means of health education of parents is available than would be possible if the child were removed from the home.

A greatly increased interest is shown in child hygiene and school health work by the community at large. This type of health activity very easily sells itself to the community because of its tangibility. In spite of early difficulties in financing this institution, it is now safe to say that a number of agencies would volunteer support for its continuance if necessary.

CONCLUSIONS

1. A school of this kind carefully operated along sound health, social and educational lines is a necessary adjunct to the tuberculosis program of a community.
2. Such a school is one solution for the economic difficulty of providing adequate preventorium space in the average community.
3. This type of school is superior to the so-called open air school because:
   a. Health work is more intensive.
   b. Rest receives more emphasis.
   c. Sun and air exposure are made part of the program.
   d. It calls for a complete break from the child's past routine which tends to impress both child and parents and thereby obtain better coöperation.
4. Such schools will not replace the preventorium, but are best regarded as an

auxiliary to the preventorium and sanatorium, as well as to the school health program. If future experience bears out our observation that 73 per cent of these children can be cared for without subjecting the community to the expense of putting them in a preventorium, then it is felt that such a plan is justified. On the other hand, some provision must still be made for the 27 per cent who are not improved by the preventorium school.

5. Such a school should be centralized in one building rather than generalized in a preventorium room in each of several schools because:

a. The plan will usually need financial support in addition to what the Board of Education can supply. This is much more easily obtained by operating a centralized plant which can be visited and described with ease.

b. A centralized school removes the possibility of stigmatizing children who would otherwise be segregated for health reasons in a regular school.

c. Curriculum modifications are so drastic that success depends upon a high degree of coöperation from the school principal. Such coöperation is much easier to obtain from one school principal and his teaching staff than from 15 or 20.

d. This school requires a decided change in the child's routine which impresses parents and assures better coöperation from the home.

e. Coördination of health centers, preventoria and sanatoria, and school health program is easier to attain through one such school than for numerous schools.

REFERENCES:

1. *Fifth Annual Report*, Lymanhurst School, Dept. of Public Welfare, Minneapolis.
2. Potter, Philip S. The Sunshine School. A Preliminary Survey, *Arch. Pediat.*, XLV, 1 (Jan.), 1928.

Mid-morning Nourishment

What Will Probably Cause Your Death?

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HAVING reached any given age, what is the probability that a person will die of cancer? the probability that he will die of heart disease, etc.? These are questions of real interest to every woman and man.

In the tables given, at specified ages, the per cent probabilities of dying eventually of certain specified causes of death.

Epidemic or Endemic Diseases—The probability of a white male dying of such a cause ranges from 4.9 per cent at birth to 2.5 at ages 50 to 60 years, and is 3.0 per cent at age 90. The corresponding probabilities for white females are fractionally higher throughout life but still closely parallel the male probabilities, ranging from 5.3 at birth to 3.0 at ages 50 to 60 years and to 3.3 at age 90.

For the colored, the percentages range from 7.2 for colored females at birth to 3.9 for colored males aged 50, 60 and 90 years.

Tuberculosis—For white males at birth, the probability figure is 6 per cent and the highest probability of dying of this disease (6.7 per cent) appears at age 15, after which there is a continuous decline until at age 90 the figure is 0.2 per cent; for white females at birth the figure is 5.7 and the highest probability is at ages 1 to 15 (6.1 per cent), followed by a continuous decline to 0.2 per cent at age 90.

For colored males, the figure at birth is 11.4 and the highest probability, 13.0, appears for children 5 and 10, after which the trend is downward to 0.7 per cent at age 90, the probability figures at each age, however, always being much higher than those for white males of the same age; for colored females at birth the figure is 12.3 and the highest probability, 13.8, is for children aged 5 years after which there is a downward trend to 0.5 per cent at age 90, the probability figures at each age being much higher than for white females of the same age.

Cancer—For white males at birth the figure is 7.6 and the highest probability is at age 50 (10.1 per cent). After that age the figures steadily decline to 3.4 per cent at age 90; for white females at birth the figure is 10.6 and the highest probability figure is at age 40 (13.1 per cent) after which the trend is downward to 3.8 per cent at age 90.

For colored males the figure at birth is 2.5 and the highest proba-

TABLE I

PROBABLE CAUSE OF DEATH

OF 100 WHITE MALES REACHING THE AGE OF 40 YEARS

Number	Eventual Cause of Death
23	Heart disease
12	Nephritis
12	Cerebral hemorrhage
10	Cancer
7	Pneumonia
7	External violence
4	Tuberculosis
25	Other causes

OF 100 COLORED MALES REACHING THE AGE OF 40 YEARS

Number	Eventual Cause of Death
20	Heart disease
16	Nephritis
9	Cerebral hemorrhage
7	Tuberculosis
7	Pneumonia
5	External violence
4	Cancer
32	Other causes

OF 100 WHITE MALES REACHING THE AGE OF 60 YEARS

Number	Eventual Cause of Death
25	Heart disease
14	Cerebral hemorrhage
13	Nephritis
10	Cancer
6	Pneumonia
5	External violence
2	Tuberculosis
25	Other causes

OF 100 COLORED MALES REACHING THE AGE OF 60 YEARS

Number	Eventual Cause of Death
21	Heart disease
18	Nephritis
10	Cerebral hemorrhage
7	Old age
6	Pneumonia
4	Cancer
4	Tuberculosis
3	External violence
27	Other causes

OF 100 WHITE FEMALES REACHING THE AGE OF 40 YEARS

Number	Eventual Cause of Death
23	Heart disease
14	Cerebral hemorrhage
13	Cancer
11	Nephritis
7	Pneumonia
4	External violence
3	Tuberculosis
25	Other causes

OF 100 COLORED FEMALES REACHING THE AGE OF 40 YEARS

Number	Eventual Cause of Death
21	Heart disease
13	Nephritis
12	Cerebral hemorrhage
8	Cancer
6	Pneumonia
5	Tuberculosis
2	External violence
33	Other causes

OF 100 WHITE FEMALES REACHING THE AGE OF 60 YEARS

Number	Eventual Cause of Death
25	Heart disease
15	Cerebral hemorrhage
11	Nephritis
11	Cancer
7	Pneumonia
4	External violence
2	Tuberculosis
25	Other causes

OF 100 COLORED FEMALES REACHING THE AGE OF 60 YEARS

Number	Eventual Cause of Death
21	Heart disease
14	Nephritis
13	Cerebral hemorrhage
8	Old age
7	Cancer
6	Pneumonia
3	Tuberculosis
2	External violence
26	Other causes

bility per cent is 4.0 at age 50, and for colored females the figure at birth is 5.4 and the highest probability per cent is 8.0 at age 40.

Diabetes—For white males the figure is 1.4 at birth and 1.6 at ages 40 to 60, after which the trend declines gradually until it reaches 0.4 per cent at age 90; for white females the figure at birth is 2.1, the highest probability figure is 2.6 per cent for age 50 and the lowest figure is 0.3 per cent for age 90.

For colored males the figure at birth is 0.6 per cent, the highest probability figure is 0.8 per cent for ages 40 to 60, and the lowest, 0.3, for age 90; and for colored females the figure at birth is 0.9, the highest probability figure is 1.3 per cent for ages 40 to 50, and the lowest, 0.4, for age 90.

Cerebral Hemorrhage—For white males at birth the per cent figure is 9.1 and the probability of dying of this disease increases to 14.1 at age 70 and then decreases to 10.4 at age 90; for white females the per cent figure is 10.5 at birth followed by a trend upward to 15.4 at age 70 and then a downward trend to 11.5 at age 90.

For colored males the figure is 5.8 at birth, 10 at age 60, and 6.2 at age 90; for colored females the figure is 7.6 at birth, 13.3 at age 60 and 8.6 at age 90.

Heart Disease—For white males at birth the per cent figure is 18.2 and the probability of dying of this disease increases to 25.6 at age 70 and then decreases to 21.5 at age 90; for white females the per cent figure is 18.5 at birth followed by a trend upward to 25.4 at age 70 and then a downward trend to 21.9 at age 90.

For colored males the figure is 13.7 at birth, 20.8 at ages 50 and 60 followed by a decline to 14.5 at age 90; for colored females the figure is 14.2 at birth, 21.3 at age 50 followed by a decline to 14.6 at age 90.

Pneumonia—For white males at birth the probability figure is 7.6, the trend is then downward to 6.2 at age 60 and then upward to 7.1 at age 90; for white females the probability trend starts with 7.5 at birth, declines to 6.7 at ages 5 to 20 and then increases to 7.9 at age 90.

For the colored at birth the figure for males is 9.2 and for females 7.4 and the trend for each sex is downward to 4.7 for males aged 80 and 4.8 for females aged 90.

Nephritis—For white males the figure is 9.1 at birth, 13.1 at age 70 and 11.2 at age 90; for white females, 9.1 at birth, 11.4 at age 60 and 8.4 at age 90; for colored males, 10.3 at birth, 18.0 at age 70 and 13.2 at age 90; for colored females, 9.0 at birth, 13.5 at ages 50 to 60 and 9.2 at age 90.

Automobile Accidents—At birth, the highest probability of dying from this cause (1.5 per cent) appears for white males; at age 2 years this probability has increased to 1.7. From that age the trend is downward until at age 90 it is 0.2 per cent.

Other Forms of External Violence—For white males the figure is 8.0 at birth and 8.7 at age 2. There is then a downward trend until at age 70 the figure is 3.4 and then an upward trend to 4.4 at age 90; for white females the figure is 3.8 at birth and 4.0 at ages 1 and 2; then

TABLE II

Per cent Probabilities, at specified ages, of dying eventually of specified causes.
(Figures based on life tables 1919-1920, and on deaths 1921-1925 in the 34 registration States of 1920 and the District of Columbia.)

Cause of death, color and sex		Per cent probability, at specified age, of dying eventually of specified cause													
		At birth	1 year	2 years	5 years	10 years	15 years	20 years	30 years	40 years	50 years	60 years	70 years	80 years	90 years
All causes for each sex by color		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Epidemic and endemic diseases:															
White	Males	4.9	4.7	4.3	3.6	3.3	3.2	3.0	2.8	2.7	2.5	2.5	2.6	2.8	3.0
	Females	5.3	5.1	4.7	4.0	3.7	3.5	3.4	3.2	3.1	3.0	3.0	3.1	3.2	3.3
Colored	Males	6.6	6.4	5.9	5.3	5.0	4.7	4.4	4.1	4.0	3.9	3.9	4.0	4.0	3.9
	Females	7.2	6.9	6.5	5.9	5.5	5.1	4.8	4.6	4.4	4.4	4.5	4.6	4.8	4.4
Tuberculosis (all forms):															
White	Males	6.0	6.5	6.5	6.6	6.6	6.7	6.5	5.4	4.1	3.1	2.2	1.3	0.6	0.2
	Females	5.7	6.1	6.1	6.1	6.1	6.1	5.7	4.1	2.9	2.2	1.7	1.2	0.6	0.2
Colored	Males	11.4	12.7	12.9	13.0	13.0	12.9	12.1	9.1	6.6	4.9	3.6	2.4	1.5	0.7
	Females	12.3	13.4	13.6	13.8	13.7	13.4	12.0	8.1	5.3	3.6	2.5	1.8	1.1	0.5
Cancer and other malignant tumors:															
White	Males	7.6	8.3	8.4	8.6	8.7	8.8	9.0	9.4	9.8	10.1	9.7	8.3	5.7	3.4
	Females	10.6	11.4	11.5	11.8	11.9	12.0	12.1	12.8	13.1	12.6	11.2	8.9	6.1	3.8
Colored	Males	2.5	2.8	2.9	3.0	3.0	3.0	3.2	3.5	3.8	4.0	3.7	2.9	2.1	1.1
	Females	5.4	6.0	6.1	6.2	6.3	6.5	6.8	7.6	8.0	7.5	6.5	5.0	3.5	2.2
Diabetes mellitus:															
White	Males	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.2	0.7	0.4
	Females	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.6	2.3	1.6	0.8	0.3
Colored	Males	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.5	0.3
	Females	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.2	1.3	1.3	1.0	0.8	0.6	0.4
Cerebral hemorrhage:															
White	Males	9.1	9.9	10.0	10.3	10.4	10.5	10.7	11.3	12.0	12.8	13.6	14.1	13.3	10.4
	Females	10.5	11.2	11.4	11.6	11.7	11.9	12.1	12.7	13.6	14.2	14.9	15.4	14.7	11.5
Colored	Males	5.8	6.5	6.6	6.8	6.9	7.0	7.3	8.2	9.1	9.8	10.0	9.6	8.5	6.2
	Females	7.6	8.3	8.5	8.7	8.9	9.1	9.5	10.8	12.3	13.2	13.3	12.7	11.0	8.6
Diseases of the heart:															
White	Males	18.2	19.8	20.2	20.6	20.8	20.9	21.2	22.0	23.1	24.1	25.0	25.6	25.1	21.5
	Females	18.5	19.8	20.1	20.5	20.6	20.7	20.9	21.8	22.7	23.6	24.6	25.4	24.8	21.9
Colored	Males	13.7	15.3	15.7	16.1	16.4	16.6	17.1	18.7	20.1	20.8	20.8	20.4	18.4	14.5
	Females	14.2	15.5	15.9	16.3	16.5	16.7	17.4	19.1	20.6	21.3	21.2	20.4	18.5	14.6
Other diseases of the circulatory system:															
White	Males	3.5	3.8	3.8	3.9	4.0	4.0	4.1	4.3	4.6	5.0	5.6	6.7	8.8	11.4
	Females	3.0	3.3	3.3	3.4	3.4	3.4	3.5	3.7	3.9	4.2	4.7	5.7	7.6	10.1
Colored	Males	1.8	2.0	2.1	2.1	2.2	2.2	2.3	2.6	2.8	3.0	3.4	4.0	4.4	4.6
	Females	1.4	1.6	1.6	1.6	1.7	1.7	1.8	2.0	2.3	2.6	3.0	3.6	4.0	4.6

TABLE 11 (cont.)

Per cent Probabilities, at specified ages, of dying eventually of specified causes.
(Figures based on life tables 1919-1920, and on deaths 1921-1925 in the 34 registration States of 1920 and the District of Columbia.)

Cause of death, color and sex		Per cent probability, at specified age, of dying eventually of specified cause													
		At birth	1 year	2 years	5 years	10 years	15 years	20 years	30 years	40 years	50 years	60 years	70 years	80 years	90 years
Pneumonia (all forms):															
White	Males	7.6	7.1	6.9	6.7	6.7	6.7	6.7	6.7	6.5	6.3	6.2	6.3	6.7	7.1
	Females	7.5	7.1	6.8	6.7	6.7	6.7	6.7	6.8	6.8	6.9	7.1	7.4	7.8	7.9
Colored	Males	9.2	8.5	8.0	7.7	7.7	7.7	7.5	7.1	6.5	6.0	5.6	5.2	4.7	4.9
	Females	7.4	6.7	6.3	6.0	5.9	5.8	5.8	5.8	5.7	5.7	5.6	5.4	5.2	4.8
Diseases of the digestive system:															
White	Males	7.2	6.3	5.9	5.7	5.6	5.5	5.4	5.3	5.1	4.8	4.3	3.8	3.5	3.1
	Females	6.9	6.1	5.8	5.6	5.6	5.5	5.4	5.4	5.2	4.9	4.5	4.1	3.7	3.2
Colored	Males	6.8	5.6	5.1	4.9	4.8	4.8	4.7	4.8	4.6	4.3	3.8	3.5	3.0	2.8
	Females	6.7	5.7	5.3	5.1	5.0	5.0	5.0	5.0	4.7	4.4	4.0	3.5	2.9	2.9
Nephritis:															
White	Males	9.1	9.9	10.1	10.3	10.4	10.5	10.6	11.0	11.6	12.1	12.6	13.1	12.8	11.2
	Females	9.1	9.7	9.8	10.0	10.1	10.2	10.3	10.7	11.1	11.3	11.4	11.3	10.4	8.4
Colored	Males	10.3	11.5	11.8	12.1	12.2	12.4	12.9	14.2	15.7	16.9	17.8	18.0	16.8	13.2
	Females	9.0	9.8	10.0	10.3	10.4	10.6	11.0	12.1	13.0	13.5	13.5	12.8	11.6	9.2
Puerperal diseases:															
White	Females	2.1	2.2	2.3	2.3	2.3	2.3	2.2	1.2	0.2	[1]	....	....	....	....
Colored		2.9	3.2	3.3	3.4	3.5	3.5	3.0	1.7	0.4	[1]	....	....	....	....
Automobile accidents:															
White	Males	1.5	1.6	1.7	1.6	1.5	1.4	1.3	1.2	1.0	0.8	0.7	0.6	0.4	0.2
	Females	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	[1]
Colored	Males	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
	Females	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	[1]
Other forms of external violence:															
White	Males	8.0	8.6	8.7	8.6	8.5	8.4	8.1	7.0	5.9	4.9	4.0	3.4	3.5	4.4
	Females	3.8	4.0	4.0	3.9	3.8	3.7	3.7	3.5	3.5	3.4	3.5	4.0	5.2	6.4
Colored	Males	8.3	9.1	9.2	9.2	9.1	8.9	8.3	6.6	4.7	3.6	2.9	2.4	2.2	2.1
	Females	3.2	3.4	3.3	3.0	2.8	2.7	2.7	2.3	2.0	2.0	2.1	2.2.	2.5	2.4
Old age:															
White	Males	1.3	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.8	2.0	2.4	3.4	6.2	13.4
	Females	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.5	2.7	3.2	4.3	7.4	14.7
Colored	Males	2.7	3.0	3.1	3.2	3.2	3.3	3.5	3.9	4.5	5.3	6.9	10.0	17.1	28.9
	Females	2.9	3.2	3.2	3.3	3.4	3.5	3.6	4.1	4.9	6.0	8.1	12.2	19.0	31.4
Ill-defined diseases:															
White	Males	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.8
	Females	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7
Colored	Males	5.0	4.0	4.0	3.9	3.9	3.9	4.0	4.2	4.6	5.0	5.5	6.2	6.9	8.0
	Females	4.8	4.0	3.9	3.9	3.8	3.8	3.9	4.1	4.4	4.7	5.2	5.8	6.6	7.5
All other causes:															
White	Males	13.8	9.9	9.9	9.8	9.8	9.7	9.7	9.8	9.6	9.2	8.9	8.9	9.3	9.5
	Females	11.8	8.7	8.7	8.7	8.6	8.6	8.5	8.4	8.0	7.5	7.1	6.9	7.0	7.6
Colored	Males	14.5	11.1	11.1	11.1	11.1	11.1	11.2	11.6	11.6	11.2	10.9	10.4	9.7	8.7
	Females	13.8	11.1	11.2	11.2	11.3	11.3	11.4	11.3	10.5	9.6	9.3	9.1	8.6	6.5

[1] Less than one-tenth of 1 per cent.

there is a downward trend to 3.4 at age 50 and then an upward trend to 6.4 at age 90.

For colored males the figure at birth is 8.3 and 9.2 at ages 2 to 5 and then a continuous downward trend to 2.1 at age 90; for colored females the figure is 3.2 at birth and 3.4 at 1 year. Then follows a downward trend to 2.0 at ages 40 to 50 and an upward trend to 2.5 at age 80.

To avoid too lengthy a presentation of this subject, no further discussion will be made of the figures for white females and of the figures for the colored of both sexes beyond calling attention to the very much greater probability that the colored will die of old age or of some indefinite cause.

Commenting briefly upon a few of the figures for white males: at age 50 the probability of having the cause of your death certified as old age is 2.0 per cent, at age 70 the probability figure has risen only to 3.4 per cent, at age 80 it has reached 6.2 per cent and at age 90, 13.4 per cent.

The probability of having some ill-defined disease given as the cause of your death is never great, the figure remaining at 0.6 or 0.7 from age 1 to age 80, inclusive.

For the group, *All other causes,* the probability figure ranges from 9.9 to 9.7 from 1 year to 30 years, inclusive, after which there is a slight downward trend until the figure 8.9 is reached at age 70 and then an upward trend to 9.5 at age 90.

Some very interesting facts—and I may add some very comforting facts—are disclosed by Table II, for example:

1. The probability of dying of heart disease, cerebral hemorrhage or nephritis increases up to and including the age of 70.

On the other hand:

2. After the age of 2 years, the probability that a male will die from an automobile accident continually diminishes.

3. After the age of 2 years, the probability that a male will die from external violence continuously diminishes until up to and including the age of 70.

4. After the age of 15, the probability that a man will die of tuberculosis continually diminishes.

5. After age 50, the probability that a man will die of cancer continually diminishes.

6. After age 60, the probability that a man will die of diabetes continually diminishes.

Comparative Studies in Typhoid Stool Examinations

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THE data presented herein were obtained during our studies to determine the relative merits of mediums recommended within recent years for typhoid stool examinations. The necessity for utilizing any method which offered an advantage was rather urgently brought upon us in the study of a milk-borne epidemic of typhoid fever in which epidemiological evidence pointed to a carrier on whom bacteriological proof was lacking. The suspected carrier had been examined in 1925 in connection with another epidemic, with negative results, and a number of specimens obtained from him in 1926, at the beginning of a second epidemic, were negative. This situation might be explained on the basis of the intermittency of many carriers, and yet the importance of this case made it necessary for us to know just what significance should be attached to our negative findings.

Furthermore, previous studies of typhoid carriers in Ohio have been largely restricted to immediate investigations of epidemics, no state-wide survey, such as Minnesota and Alabama have conducted, having been undertaken in this state. The possibility of such a survey being inaugurated made it very desirable to have data on methods of collecting and examining feces specimens which might be shipped to the laboratory. It has been customary in our laboratory when investigating a suspected carrier to have the fresh specimens forwarded by messenger or by mail to avoid undue delay. Such specimens are then examined promptly by direct plating on Endo or easin-methylene-blue agar. We have appreciated the shortcomings of such a method, especially when there was any delay in delivery of the specimen, and yet in attempting to choose a different method we were somewhat in doubt as to the respective merits of one or another procedure recommended for such work.

Teague and Clurman [1] in a study of methods for preserving typhoid stools recommended 30 per cent glycerine in saline. Wade, Kelly, and Giblin [2] reported very favorable results with this method, and in an extensive series of comparative tests by plating direct, and by plating from the glycerinized specimens, they found a very close agreement in

the number of positive findings of both typhoid and paratyphoid bacilli by the two methods. A number of laboratories are using the plain glycerine-saline. Havens,[3] utilizing a brilliant green bile medium in a state-wide survey of carriers, obtained very satisfactory results. However, the use of Havens' original formula by Wade, Kelly, and Giblin[2] did not seem to give them as favorable results as a mixture of brilliant green-glycerine-saline which they tried out in a comparative study. Later studies by Havens[4] indicated certain improvements in his original method of preparing the brilliant green bile medium. This change was made by Havens because of the quality of brilliant green then available, and of its inferiority as compared with dyes which he used in his earliest studies.[5]

The question of a suitable brilliant green appears to be an important factor in the bile medium. This matter of variation in the effectiveness of dyes has recently been given careful study by Rakieten and Rettger[6] and, as will be shown later, our own limited experiments emphasize the desirability for further study of this particular question.

One of the advantages claimed for the brilliant green-glycerine-saline by Wade and associates is that it permits a larger amount of stool to be added, a factor of considerable importance where inexperienced persons may collect the specimen. The principal advantage noted for the brilliant green bile by Havens is that it apparently permits multiplication of typhoid bacilli, thereby offering more opportunity for recovery of such organisms even when the original inoculum contains but small numbers. Because of the different results reported with these mediums, it seemed advisable to give this matter further study, especially since the question of their relative sensitiveness, as compared with direct plating, could be applied to specimens from the carrier in question, and to specimens from a considerable number of convalescents in an epidemic of typhoid fever involving more than 100 cases.

In deciding upon plating mediums for such a comparison, a selection may be made from several varieties, all of which have apparently given satisfactory results. Our choice of brilliant green Endo was based largely on the fact that it combines the universally used Endo with the brilliant green feature utilized with much success by Krumwiede and others, and because this modified Endo had given very good results in Havens' work. We selected E. M. B. agar as a second plating medium because we have found it to be so satisfactory in routine work with the colon-aerogenes group, and also because it has become widely used in this country, and is a very stable stock medium.

As already stated, this study was begun in connection with a typhoid epidemic. The stools from the convalescents who were awaiting negative laboratory tests before final discharge were utilized as experimental material. Through the coöperation of a local county laboratory,* arrangements were made to prepare direct plates from the fresh stools from these convalescents as soon as possible after collection of specimens and at the same time to inoculate each of the two fluid mediums with about ¼ gm. The latter tubes were held at room temperature and were plated at 24, 48, and 72 hours on B. G. Endo or E. M. B. agar. All cultures obtained from suspicious colonies on these plates were transferred to triple sugar slants and brought to the central laboratory for final identification. Any cultures showing typhoid or paratyphoid-like reactions on the triple sugar were tested for agglutination. If the agglutination was negative on the first test, the culture was tested again after several transfers on agar. We encountered no cultures which were inagglutinable after such transfers and which otherwise gave typical cultural tests for *B. typhosus*.

The amount of each specimen collected did not always permit making a complete comparative test, but in a total of 132 stools, the procedure outlined in Table I was carried out.

TABLE I

COMPARISON OF DIRECT PLATING AND ENRICHMENT OF STOOLS FROM RECENTLY RECOVERED CASES OF TYPHOID FEVER

	Direct Plates		Brilliant Green Bile	Brilliant Green Glycerine-saline
	B. G. Endo	E. M. B. Agar		
Positive	15	14	20	14
Negative	117	118	112	118
Total	132	132	132	132
Per cent positive	11.3	10.5	16.9	10.5

A total of 21 additional specimens from these cases were examined but on account of insufficient material, only three mediums were used, viz., direct Endo & E. M. B. plates, and B. G. bile enrichment. In 3 of these specimens positive results were obtained in all three mediums. One was positive on direct Endo only, one was positive on direct E. M. B. and on B. G. bile, and two were positive in B. G. bile only.

The foregoing figures show that there is little choice between B. G. Endo and E. M. B. as direct plating mediums, as based on the number of positive findings. The B. G. bile and B. G. glycerine-saline show very satisfactory results as compared with the direct platings. It should perhaps be noted that the amount of inoculum was practically the same in both mediums, and that we did not attempt to study fully

* We are indebted to C. H. Waite, Bacteriologist, Lorain County, O., Health Department Laboratory for his valuable assistance, and to Dr. I. C. Riggin, Health Commissioner, for his coöperation in this work.

the question of over-inoculation which might occur under the usual field conditions. However, in order to check this point we selected a few specimens of known positive stools and inoculated B. G. glycerine-saline lightly, and heavily from the same specimen. In general, the number of typhoid colonies on the plates from these mixtures was proportionate to the amount of inoculum. The same test, applied to the B. G. bile showed overgrowth by other intestinal organisms which either obscured or prevented development of typhoid colonies when more than about ¼ gm. was used. Havens cautions against over-inoculation of his medium.

SPECIMENS FROM KNOWN CARRIER

A series of specimens from a known carrier were examined in the same manner as above except that only B. G. Endo was employed for plating. This man was under our direct supervision so that all specimens were delivered promptly and ample material was available. A total of 50 feces specimens collected within a period of several months were examined with the following results:

Total feces specimens from carrier	50
Total number found positive, one or all methods	35
Positive on direct plates, B. G. Endo	26
Positive in B. G. bile	27
Positive in B. G. glycerine	24

Classifying these still further on the basis of individual mediums, we have the following:

Direct plates	+	+	+	+	—	—	—	—
B. G. Bile	+	+	—	—	+	—	+	—
B. G. Glycerine	+	—	—	+	+	+	—	—
Number	17	5	4	0	3	4	2	15

Comparing the total positive findings on each medium we see a very close agreement between direct plating and the two fluid mediums. However, if we classify the results in the manner immediately preceding, we find that there was an advantage in using one or another of the fluid mediums along with the direct platings since there were a total of 9 specimens positive with the fluid mediums but negative with the direct plates, and 4 specimens in which the reverse was true. One cannot estimate the extent to which chance selection of material from a feces specimen might influence the result in one or another medium. It is reasonable to assume that by elaborating on the number of mediums employed, we might expect a few additional positive findings because of this chance selection and the larger amount of the original stool examined, and yet the employment of more than one fluid medium in transporting specimens would be impractical. Furthermore, our results would not justify such a plan. There were 6 specimens positive in B. G. bile which were negative in B. G. glycerine-saline

as compared with 4 specimens giving the opposite result. Both mediums were about equally reliable in this series.

Bact. aerogenes was present in practically every specimen obtained from this carrier and was a disturbing factor on direct plates and the bile medium, particularly on the 48-, and 72-hour plates. The 30 per cent glycerine-saline medium in most instances controlled any tendency to overgrowth by this organism. On the other hand, while the appearance of so many aerogenes colonies on plates from the bile medium was early noted as quite objectionable, this fact did not seriously affect the number of positive findings, especially on the plates made from the bile at 24 hours. It should also be noted here that *Bact. aerogenes* develops more rapidly and forms larger colonies on E. M. B. plates than on B. G. Endo, and for that reason the former is somewhat less desirable in specimens containing this organism.

We attempted to control the overgrowth of aerogenes by using glycerine in the bile in a concentration which preliminary tests had shown to be sufficient to partially restrain this organism as well as *Bact. coli.* This required about 14 per cent of glycerine. A small series of specimens collected weekly from this carrier were examined with direct plates, B. G. bile and B. G. bile + 14 per cent glycerine. At this time his stools contained rather large numbers of typhoid bacilli so that it is perhaps not surprising that we obtained positives by all three methods on the 12 specimens examined. In only one instance during this period were there less than about 100 typhoid colonies on direct plates.* On this day only 2 typhoid colonies were found on direct B. G. Endo, but we were successful in isolating the organisms from both liquid mediums. This was somewhat surprising in view of experiments to which we will refer later. While on the basis of these figures there was little apparent difference between the efficiency of the bile, with and without glycerine, it should be noted that whereas the former was uniformly positive on the three successive platings and kept the aerogenes organisms somewhat in check, the bile without glycerine was negative in 1 specimen at 48 hours and in 3 specimens at 72 hours, the plates from these tubes showing almost all aerogenes colonies.

ADDITIONAL COMPARATIVE TESTS

A further comparative series was carried through direct platings, B. G. bile, B. G. glycerine-saline, and B. G. bile + 14 per cent glycerine. For this study both naturally infected stools from carriers and active cases, artificially inoculated stools, and specimens obtained

* Estimates based on gross appearance of colonies, a few representative ones being selected for confirmation.

in routine examinations for possible carriers, were utilized. The results are shown in Table II.

TABLE II

	B. G. Endo Direct	B. G. Glycerine-saline	B. G. bile	B. G. bile + 14 per cent glycerine
Artificially Infected Stools				
Positive	12	11	10	11
Negative	2	3	4	3
Total	14	14	14	14
Naturally Infected and Routine Stools				
Positive	16	17	14	17
Negative	40	39	42	39
Total	56	56	56	56

This series again emphasizes the close agreement between direct plating and both of the enrichment methods employed in our earlier series as well as a rather close agreement between results in the B. G. bile with, and without glycerine. A few specimens in this series represent positive stools which were held several days after the first test, to determine the relative efficiency of the methods where the number of typhoid bacilli would presumably be constantly decreasing. In 2 specimens held 3 and 4 days respectively, the direct plates were negative and all three liquid mediums gave positive results, while in 1 specimen held 8 days, the opposite was true.

In 20 of these specimens we used the original Teague and Clurman method of 30 per cent glycerine-saline, in addition to the methods shown in Table II. Direct plates from this medium gave the same percentage of positives as the B. G. glycerine-saline, but it was noted in the majority of these positive specimens that the second and third day's platings from the plain glycerine-saline gave more typhoid colonies than the G. B. glycerine-saline.

QUANTITATIVE EXPERIMENTS

In order to determine the approximate minimum number of typhoid bacilli which could be detected by the different methods, the experiment outlined in Table III was performed. This experiment was then duplicated, using a specimen with a different content of typhoid bacilli for the inoculum. The results of the two experiments agreed as closely as one might expect when dealing with such mixtures as fecal suspensions.

It is of interest to note that with two exceptions, no positive results were obtained with the technic we employed, in any of the liquid mediums when less than about 4500 typhoid bacilli were added to 15 c.c. of each medium. It is difficult to make accurate calculations on such mixtures but in the specimen used, the ratio of typhoid colonies to other fecal types which developed on direct Endo plates was about 1-50. There

was no evidence of multiplication of typhoid bacilli in any of the liquid mediums but a gradual decrease of these organisms and a more rapid decrease of other forms. On this basis it is not so surprising, therefore, that a considerable number of typhoid bacilli must be present in the original inoculum to compensate for the dilution. A rough theoretical calculation based on the amount of sample added and the size of the loop used for plating indicated that the figures given in Table III are approximately what one might expect in the absence of any multiplication of typhoid bacilli. In short, these calculations indicate that there should not be a wide difference between positive findings by direct plates and by the use of these liquid mediums. The quantitative tests and calculations appear to confirm our results in the qualitative series.

RAKIETEN AND RETTGER METHOD

In the midst of this experiment the recent studies by Rakieten and Rettger [6] on a brilliant green enrichment medium came to our attention. Their results are indeed striking as compared with our experience in direct plating. For example, these authors report that in 204 specimens of artificially inoculated stools not a single positive was obtained on direct plates while 93 per cent of the specimens gave positive results

TABLE III

RESULTS IN DIFFERENT MEDIA INOCULATED WITH INCREASING DILUTIONS OF SUSPENSION OF TYPHOID STOOL

		1		2		3		4		5		6	
Amount of stool used		About ¼ gram*		1/10 dil. of No. 1		1/100 dil of No. 1		1/1,000 dil. of No. 1		1/10,000 dil. of No. 1		1/100,000 dil. of No. 1	
Typh. bacilli**		4,500,000		450,000		45,000		4,500		450		45	
Other bacteria**		237,000,000		23,750,000		2,375,000		237,500		23,750		2,375	
	Days	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others
30 per cent Glycerine saline +1/1,500 Brilliant Green	1	10	x	3	x	3	54	0	18	1	5	This dilution was not inoculated into liquid mediums.	
	2	5	x	3	x	0	46	1	12	0	1		
	3	7	x	12	40	2	4	1	2	1	0		
	4	0	x	0	20	0	15	0	2	ng.	ng.		
	5	3	x	1	15	2	13	0	2	0	1		
	7	0	14	0	7	0	4	ng.	ng.	ng.	ng.		
Brilliant Green Bile 1/200	1	4	x	8	x	1	8	1	12	ng.	ng.		
	2	1	x	3	x	0	7	0	4	ng.	ng.		
	3	0	x	14	x	3	24	0	x	0	13		
	4	0	x	0	x	0	x	0	x	0	18		
	5	0	x	0	x	0	x	0	x	0	40		
	7	0	x	0	x	0	x	0	x	0	10		
Brilliant Green Bile 1/200+14 per cent glycerine	1	12	x	9	x	5	30	3	15	ng.	ng.		
	2	2	x	4	x	4	28	0	13	ng.	ng.		
	3	2	20	8	50	1	3	ng.	ng.	ng.	ng.		
	4	2	24	0	x	0	10	0	0	0	1		
	5	0	35	1	25	1	15	ng.	ng.	ng.	ng.		
	7	0	x	0	12	ng.	ng.	ng.	ng.	ng.	ng.		
30 per cent Glycerine saline	1	13	x	14	x	4	60	1	4	0	3		
	2	3	x	11	x	6	35	0	1	0	1		
	3	12	x	4	x	6	26	ng.	ng.	ng.	ng.		
	4	1	x	0	x	0	35	ng.	ng.	ng.	ng.		
	5	3	x	1	x	0	38	ng.	ng.	ng.	ng.		
	7	0	20	0	18	0	4	ng.	ng.	ng.	ng.		

*Portion size of pea

**Estimates based on colony count on Endo inoculated with 0.1c.c. of 1/100,000 dilution

x=Colonies too numerous to count. ng=No growth on plate.

after enrichment in brilliant green peptone broth. Although no numerical data are shown to indicate the probable density of typhoid bacilli in their specimens, it would appear that by inoculating the stools "lightly" with a typhoid culture, the bacilli were much below the concentration we have found necessary to obtain a positive result by direct plates. The Rakieten and Rettger medium is not suitable for field use since a very light inoculation is necessary, but their enrichment method might prove valuable for secondary inoculation from feces suspensions preserved and transported in glycerine. That is, one might recover typhoid bacilli from such suspensions by using their brilliant green peptone broth where direct plating from the glycerine was negative due to the small number of bacilli in the glycerine. We are making a further study of this question. In our limited experiments we have been unable to obtain a dye which gave the favorable results they have reported but we have recently received from Dr. Rakieten a sample of two lots of brilliant green which gave satisfactory results in his work. We have not had an opportunity to test these samples completely in comparison with ten other brands we had previously tried, all of which gave rather discouraging results.

PLATING MEDIUMS

Although a considerable variety of plating mediums have been recommended by different workers, it appears that Endo and E. M. B. agar have gained most favor. However, in view of the recent report of Rakieten and Rettger, it seemed advisable to make a few comparative tests with several mediums in order to determine the relative value of the two mediums we had employed. To this end in several experiments the mediums listed below were inoculated with the same amount of fecal suspensions containing typhoid bacilli, both natural and artificial mixtures. Our results, based on number of typhoid colonies, number of colonies of associated bacteria, the general type of typhoid colonies, ease of recognition, etc., may be briefly summarized as follows: Plain Endo, B. G. Endo, Plain E. M. B., Levine E. M. B., Robinson and Rettger Endo, Krumwiede B. G. agar, and Conradi-Drigalski agar plates were inoculated as uniformly as possible from the same suspensions. All plates were incubated at 37° C. and readings were made at 24 and 48 hours.

All these mediums gave reasonably satisfactory results in the development of typhoid colonies, the Conradi-Drigalski showing somewhat less colony differentiation than the other plates. The Krumwiede agar showed a tendency to more luxuriant growth of *Bact. aerogenes* in two specimens containing this organism.

The Robinson and Rettger Endo produces very pretty typhoid colonies and there is less tendency to diffusion of the red color from the acid producers. However, when compared with B. G. Endo on the basis of prevalence of other colonies and the general differentiation of these from typhoid colonies, we have not observed enough superiority of any of the other mediums to justify adoption of them in preference to the B. G. Endo. This question is largely one of personal choice based on wide experience with one or another type of medium. There is some advantage in using more than one plating medium and in this event one might utilize both the B. G. Endo and Robinson and Rettger Endo.

BRILLIANT GREEN DYES

Since so much depends on brilliant green in many of the mediums used in typhoid work, it is of great importance to have reliable and fairly uniform supplies of this dye. There is apparently considerable difference in the efficiency of different lots of brilliant green. Most workers have noted the necessity for careful titration of such dyes when added to solid or liquid mediums and have commented on these variations. Havens pointed out his inability to get uniform lots and was compelled to modify his original formula for the B. G. bile to meet this situation. Rakieten and Rettger have recently shown that only a few samples out of a number tested gave satisfactory results. These authors have also shown the necessity of controlling the pH of their peptone broth medium in order to get the most effective brilliant green action.

SUMMARY

Comparative studies were made to determine the efficiency of preservative or enrichment mediums as based on results obtained by direct platings from the same specimens. Specimens employed consisted of stools from recently recovered cases, a few active cases, a permanent carrier, and routine examination for detection of carriers, as well as artificially inoculated stools.

Very close correlation in positive results was obtained with the direct platings on B. G. Endo, B. G. bile medium, and B. G. glycerine-saline. Both of the latter mediums were found to yield about the same number of typhoid colonies although the number of associated forms was much less in the glycerine mixture. No apparent multiplication of typhoid bacilli was noted in our bile preparations.

Quantitative tests further indicated a close degree of efficiency between bile and glycerine mediums, and showed little, if any, multiplication of typhoid in the former. These tests indicated that about 4500 typhoid bacilli must be added to 15 c.c. of either medium in order to recover them at the end of 24, 48, or 72 hrs.

Comparisons of various types of plating mediums showed close agreement in the percentage of positive findings. There are, however, some other factors which influenced us in continuing the use of B. G. Endo, principal, among which is its restraining action on related forms without seriously affecting the number and character of the typhoid colonies.

Our experience parallels that of other workers in respect to the variation in different lots of brilliant green dye and emphasizes the necessity for further study of this dye as to its selective action on typhoid bacilli, and the uniformity of different lots.

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Canned Foods and the Public Health*

YOUR committee, following up last year's report [1] on food preservation legislation in the United States, has sought to continue for the present year, the general subject of preserved foods with special reference to fruits and vegetables.

Powell [2] states:

The canning and preserving of food products is an important factor in household management and of even greater importance in national economy, since the conservation of foodstuffs, from the time of production and natural time of consumption to a later time, makes for a more varied and adequate diet, and that secured at a lower economic cost.

Since the interest in this subject is almost universal, some statistics relating to canned food production were gathered. In addition to analyzing these data, a very brief summing up of the present status of canned foods based on recent contributions to the subject has been attempted.

The statistics given in Table I will no doubt prove enlightening to many in that they portray the huge magnitude of the canning industry. We have included foods other than fruits and vegetables in this compilation, though they come, of course, outside the scope of this committee. Many soups are partly of vegetable composition and may properly be considered a vegetable product. Some marine products are also canned with tomato sauce, olive or cotton seed oil or mustard, all manufactured plant products. Fabricated foods such as pickles, catsup, mayonnaise, jams, jellies, etc., and many glass packed foods,

TABLE I

COMMERCIALLY CANNED FOODS
APPROXIMATE PRODUCTION IN THE UNITED STATES *
(Quantities in millions of pounds)

	1904	1914	1919	1925
Vegetables	1,115	1,703	2,148	3,426
Fruits	321	499	1,046	1,294
Meats & Meat Products	...	235	467**	119**
Marine Products***	142	454	403	495
Milk	...	873	1,791	1,931
Soups	...	154	184	313
Total	1,578	3,918	6,040	7,579

* Based on Statistics, U. S. Census Bureau, Bureau of Fisheries, and National Canners Association
** Includes only products packed in slaughtering and meat packing establishments
*** Includes Alaskan production

* Report of the Committee on Fruits, Vegetables and their Products, delivered before the Food and Drugs Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

are purposely omitted from the table because of the difficulty of obtaining reliable data concerning the amounts annually packed.

Both exports and imports of canned foods have been considered. The amount exported [5] in 1925 was 605,000,000 lbs. or 8 per cent of the total. Milk alone makes up about one-fourth of this volume. These amounts are insignificant when compared with the domestic consumption. Other countries, except Canada, fall far behind the United States in the production and consumption of canned foods. Imports [6] totaled 165,000,000 lbs. in 1925.

The per capita consumption of commercially canned foods using the data in Table I after allowance had been made for exports and imports and considering the population of the United States as 115,000,000, is 62.1 lbs. The per capita consumption of commercially canned fruits is 9.0 lbs. and of vegetables 28.4 lbs. Hollingshead [3] states that canned fruit and vegetable production was 9.7 *cans* per capita in 1905; 15.1 in 1914 and 24.9 in 1925. After converting these figures to pounds they agree closely with ours.

It is estimated that the home canned food production in the United States is a billion lbs., of which 200 million lbs. are fruits and 550 million lbs. are vegetables.* The total per capita consumption of home canned foods would be 8.7 lbs.—1.7 lbs. of fruits and 4.8 lbs. of vegetables.

We do not believe we are justified in separately treating commercial and home packed foods. For all practical purposes they are similar in nutritive value, palatability and cost. Considering them together we reach a total of canned foods annually consumed per capita of approximately 70 lbs.

What effect, if any, has the consumption of this tremendous amount of canned fruit, vegetables, etc., upon the nation's health? The annual production and consumption of these foods has been rapidly increasing since the Civil War, yet we know of no impairment to the general well-being of the people resulting from it. Canned foods are cooked in hermetically sealed containers which prevent recontamination until opened. The nutritive and calorific values of the same fruit or vegetable, fresh and canned, are essentially the same. Prescott [8] states:

> While it is possibly true that dehydrated vegetables like canned vegetables, contain less antiscorbutic material than the original vegetables in the fresh condition, this does not appear to constitute an argument against their use, as, so far as can be determined, they supply the same roughage value as fresh vegetables, the same salts and the same fuel values.

To quote an editorial in our own JOURNAL [7]:

* Based on Census reports, cost of living studies conducted by Bureau of Home Economics, U. S. Dept. Agr., Reports of the Extension Service on 4-H Club Work in various states and from data compiled by the Dept. of Agricultural Econ. Mass. Agr. College.

While fresh food is, of course, the ideal, it will probably never be available as a general thing, but we can be assured that with the knowledge we have at present and are constantly acquiring, practically all foods can be preserved not only with safety, but with their nutritive properties only slightly altered.

A greater degree of heat is usually used in the canning operation than in kitchen preparation, though an increase in the temperature of cooking alone has not been shown to impair the wholesomeness of fruits and vegetables. On the contrary the heating of fruits and vegetables in a closed container without access to atmospheric oxygen serves to prevent the loss of certain accessory food factors such as the antiscorbutic vitamin. The recent investigations of Eddy [8-9] and others have demonstrated that although different vegetables and fruits act differently, in most cases vitamins A, B, D and E are relatively uninjured while C is impaired to a greater or lesser extent by the canning process. Eddy [8] in discussing his studies on canned spinach, cabbage and apples, states:

In cooking the foodstuff, the canner has not increased vitamin destruction over that produced by the home cooking of these vegetables and fruit, but has actually accomplished his purpose with less destruction in the case of the antiscorbutic factor.

The subject of food poisoning has been much discussed and investigated during the past ten years and there are several papers on this subject to be presented at other sessions of our section by specialists who have carefully studied the problem.

Outbreaks of botulism from canned foods have apparently been effectively checked by scientific investigation and control of sterilizing processes in commercial canning, and by the revision of directions for home canning so that pressure cooking is advocated for non-acid foods. The National Canners Association [11] has received no reports of botulism from commercially canned foods since 1925. Savage [12] in England and others have reported the presence of thermostable toxins of the paratyphoid-enteritidis group in canned foods. Due to this group's inability to form spores, it appears unlikely, except accidentally, that living cells of this group of bacteria could survive in such foods. Geiger and Benson [13] as well as Koser [14] demonstrated that this group of organisms may proliferate and even elaborate toxin in certain artificially inoculated canned vegetables, meats and marine products. Your committee feels strongly the need of further investigations upon this group of bacteria in their relation to foods.

The investigation on effect of salts of tin upon the human health has been admirably handled by the Bureau of Chemistry, U. S. Department of Agriculture, and these findings will go a long way to clear up the long existing haze surrounding this question.

Likewise the question of adulterations, either with or without public health significance, in canned or fresh fruits, vegetables and their products is being constantly investigated by various municipal, state and federal agencies. The violations are becoming less numerous than formerly. Some of the regulations have little or no bearing upon the public health. For example, the Commissioner of Agriculture for Massachusetts reported,[35] "The percentage of adulterated or misbranded food that is produced in or brought into New England is practically negligible." Campbell, Director of Regulatory Work, U. S. Department of Agriculture,[4] likewise has reported a reduction in the number of prosecutions brought under the Federal Food and Drugs Act from 818 in 1920, to 258 in 1927 and in seizure cases from 1407 in 1920 to 695 in 1927.

Great progress is being made on the subject of infant feeding. Accurate and dependable information should be given to the public regarding dietetics. The knowledge of the kinds, quantity and values of each food used for human consumption is eminently desirable and education along these lines is fully as important as a wholesome supply. Because of their moderate cost, average quality, accessibility and ease of preparation, canned fruits and vegetables have greatly facilitated the use of correct, palatable diets, particularly for children.

Canned foods, whether prepared in the home or in commercial canneries, regardless of the type of container, are sound, wholesome, and safe. Their continued use is commended. The advantages to the American health from the use of canned foods in the diet can hardly be over-estimated. Improvements are possible and with the aid of research and intelligent regulation, it is believed that the future of the industry is bright. The nation may have faith in its canned foods.

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Test for Phenolic Tastes and Odors in Water After Chlorination

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THE extensive installation of by-product coke ovens in the United States during the war and since, has introduced a new problem in public health work in the matter of control of disposal of phenolic waste waters produced at such plants.

Even in dilutions of 1 to 50,000,000, these wastes are capable of producing offensive tastes and odors in public water supplies derived from streams containing them.

It has been continuously observed that the consumers of such offensive water supplies refuse to drink such water even though it be bacterially safe and in lieu thereof use palatable waters obtained from springs and other sources, which in several instances have been the cause of outbreaks of typhoid fever.

Practically all of the health departments of states in the Ohio River Basin are parties to the Ohio River Inter-State Stream Conservation Agreement,* the basic principle of which is to provide for coöperation between these state health departments in the protection of public water supplies.

The outstanding instance of success of this agreement is in the installation at a large percentage of the by-product coke oven plants on the Ohio River Basin, of either works for the complete elimination of the phenolic waste waters by their use for coke quenching or the substantial treatment of the waste waters where it is not practicable to use them for coke quenching.

On February 6 the Pennsylvania State Department of Health called a conference in Pittsburgh which was attended by representatives of most of the by-product coke oven plants and some state sanitary engineers from the Ohio River Basin, the purpose being to effect more perfect coöperation between the industry and the various state health departments.

One of the important matters considered at the conference was the establishment of a tentative standard technic for testing samples of

* For report of October 18 meeting at Cincinnati, see *A. J. P. H.*, 18, 1:104 (Jan.), 1928.

water containing these phenolic wastes, and the meeting appointed a committee of expert chemists, all of whom are experienced in this work, to prepare such a technic.

Their report which is given here may prove of interest to public health workers.

REPORT OF MEETING CALLED BY PENNSYLVANIA DEPARTMENT OF HEALTH

At a meeting held in Pittsburgh, Pa., February 6, 1928, there were representatives of the following:

Pennsylvania State Department of Health
Ohio State Department of Health
Kentucky State Board of Health
Carnegie Steel Company
Youngstown Sheet and Tube Company
Republic Iron and Steel Company
Jones and Laughlin Steel Corporation
Bethlehem Steel Company
United Gas Improvement Company
The Koppers Company

W. L. Stevenson, Chief Engineer of the Pennsylvania State Department of Health, chairman of the meeting, appointed a committee to consider the test proposed by J. W. Ellms of Cleveland, O., and report their opinion. The committee as appointed consists of F. W. Sperr, Jr., Director of Research, The Koppers Company; W. H. Fulweiler, Chemical Engineer, The United Gas Improvement Company; F. E. Daniels, Chief, Industrial Waste Section, Pennsylvania Department of Health; and O. O. Malleis, Chief Chemist, The Koppers Company.

The committee has considered the method as presented and is of the opinion that while in principle the method may be satisfactory for water works practice, it should be substantially modified to render it generally applicable. It is believed that in general a method of this sort should embody the principle of systematic dilutions with a test of each dilution, so that quantitative results can be secured. On this basis the committee has therefore drawn up a tentative method which is herewith submitted, not as final and binding, but for the purpose of inviting trial and comment. It is hoped that this method will be thoroughly examined and tried by all who are interested in the subject, and the committee would appreciate having reports of the results obtained together with any suggestions for modification or improvement that may be considered necessary.

The tentative method proposed by the committee is as follows:

1. This test is designed as a measure of the so-called phenolic tastes and odors in water after chlorination.

2. Take 500 c.c. of the material under examination, acidulate with sulphuric acid until acid to litmus, and distil off 250 c.c. Catch the distillate in a 500 c.c. volumetric flask, make up to mark with distilled water and dilute as follows: 1 to 10; 1 to 100; 1 to 1000; etc., preparing as many dilutions as may be necessary.

3. Take 200 c.c. of the distillate in the volumetric flask after making up to mark (this representing the original material undiluted) and a like amount of each successive dilution. Treat with a slight excess of chlorine water (a total of 0.3 p.p.m. of chlorine is usually sufficient). Let the sample stand for 15 minutes and then boil until excess of chlorine is removed as evidenced by test with orthotolidin.

Make the odor test by smelling the hot liquid. Make the taste test after the liquid is cooled. In the taste test, swallowing a small quantity of the liquid is the best method for revealing the presence of taste producing substances.

4. Results shall be expressed as the lowest dilution in which the taste and the odor are negative.

Pittsburgh, Pa.
February 27, 1928.

Committee

F. W. Sperr, Jr. F. E. Daniels
W. H. Fulweiler O. O. Malleis

NOTE: Communications relative to the method may be addressed to F. W. Sperr, Jr., Mellon Institute, Pittsburgh, Pa.

Welfare Measures for Young Workers

FOR the protection of the health of young workers in Austria, who suffered as the result of the wartime and post-war conditions, a series of measures are now in effect. A law provides 2 weeks of annual vacations with pay for all workers under 16 (1 week is required for workers over 16). Vacation houses for young workers, supported mainly by public social welfare agencies, have been established by the Ministry of Social Welfare. Persons unable to pay are maintained free of charge; others pay a nominal fee. Medical supervision is provided free.

The municipalities and the continuation-school authorities provide arrangements for athletics, hiking, and other health promoting activities, for young workers. An extensive system of vocational guidance has been established in many places. Supervision over the working conditions of apprentices and young industrial workers is exercised by workers' organizations and by factory inspectors.—*Lehrlingsschutz. Jugend-und Berufsfursorge*, Vienna, Apr., 1928, p. 9.

EDITORIAL SECTION

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WHY SMALLPOX?

FROM the point of view of relative mortality rates, smallpox has not in recent years has been of great importance in this country. In the 7 years 1921-1927 there were registered in 47 states and the District of Columbia, 3929 deaths from smallpox. (Rhode Island had no deaths from the disease during the period.) That number means an average of 561 per year, ranging from 135 in 1927 to 894 in 1924; and it is a small fraction of the total number of deaths. Moreover, each of several diseases, as well as the automobile, is annually responsible for many times the deaths due to smallpox. Nevertheless, health officers and health workers generally make more ado about the relatively few smallpox cases and deaths than they do about the much more serious measles, or pneumonia, or whooping cough.

The reason for this emphasis is clear enough to every informed person. While we do all we can to prevent these more destructive diseases, we cannot do much more than isolate patients and watch contacts. With smallpox, however, every case proclaims the failure to use well understood and practicable means of prevention. This disease, in proportion to the number of cases, is a constant reproach to the intelligence of any civilized community, since it is virtually 100 per cent preventable through systematic universal vaccination and re-vaccination. It is for these reasons that we consider it worth while to survey the smallpox situation from time to time, and to take account of our accomplishments or failures.

A compilation of the returns for 1927 shows that for the fifth successive year this country leads the world, outside of India, in the number of smallpox cases. We had 38,498 cases of smallpox as against 33,343 in 1926. And in the first 3 months of this year there were 17,242 cases as against 14,655 in the corresponding period of 1927.

Those interested in promoting the use of vaccination as a preventive of smallpox have relied for their arguments upon the striking preponderance of smallpox among the unvaccinated. For years the available records in this country show consistently about 91 per cent of all smallpox cases to be among the unvaccinated, about 7 per cent among those vaccinated more than 7 years previously, and 2 per cent among those vaccinated within 7 years, including vaccinations after exposure. Records of this kind are now available from less than half the states. It would be desirable to have all smallpox reporting include vaccinal history.

Smallpox history in this country has added to the experience of European countries another indication of the protective value of vaccination. Before the introduction of vaccination, smallpox was generally a children's disease—in severe epidemics it was often a disease of infancy. With the spread of vaccination the incidence of smallpox passed to progressively higher age levels. In recent years, however, communities in which vaccination has been neglected show a steady decline in the age level of smallpox cases. This would seem to be of sufficient significance to warrant the trouble of compiling smallpox statistics by ages as well as by vaccinal history, and by administrative areas.

The importance of suitable vaccination laws may be inferred from a comparison of the records for our various states on the basis of the different types of regulation that obtain. In 12 states with a total population of 36,680,000 (1926 census estimate), in which vaccination is required as a condition of school attendance, there were in the 7-year period 1921-1927, 25,124 cases of smallpox with 205 deaths. This is an average annual case rate of 9.8 per 100,000 of population. In 8 states in which the requirement of vaccination by officials is explicitly prohibited by law, there were, during the same period, 79,281 cases with 1277 deaths in a population of 12,133,000. This means an average annual case rate of 93.3 per 100,000, or nearly ten times as high in one group of states as in the other. In the states that leave vaccination requirements optional with local school or health authorities, or that permit "compulsory" vaccination during an epidemic, the case rate was 49.9 per 100,000.

Legislation alone, however, does not solve the problem. Last year Kentucky and West Virginia had respectively 350 and 320 times as many smallpox cases per capita of population as had Massachusetts, with similar statutes. On the other hand, Maine, with a relatively poor law, from the standpoint of public health protection, has for years maintained a low incidence of smallpox because it has not been

seriously exposed to an epidemic. Consistent law enforcement is as important as suitable statutes, but under the individualistic tradition that prevails in many parts of our country, universal vaccination, including systematic revaccination, must wait upon a better education of the public at large to an understanding and appreciation of preventive measures.

MAN'S LAST SPECTER—MENTAL DISEASE

PUBLIC health workers, in common with other observant persons, are regarding with mounting concern both the vastness of the problem created by mental diseases in this country and the meagerness of the resources for combating it. The statistics of the situation are impressive:

For example, there are virtually as many beds in hospitals and institutions for mental disease in the United States as there are beds in hospitals *for all other kinds of sickness combined*. The exact percentage is 44,* and not only is every bed occupied, but most institutions are from 20 to 35 per cent overcrowded.

Fifty thousand men and women never before mentally sick enter hospitals for the insane every twelve months.

From ten to twenty-one cents of every dollar collected by each state for taxation goes to the maintenance of public institutions for the mentally ill.

There is much more to the same effect. But these figures refer only to the institutional aspects of mental disease—the end results so to speak—an aspect many have suspected is probably of less importance than the extramural portion of the problem. In the offices of general practitioners and in the dispensaries of general hospitals are countless men and women whose ailments, given physical expression perhaps, are nevertheless really due to worries, fears, disappointments, disturbing memories, unsatisfied cravings, and the like. Their happiness and their business efficiency is frequently much impaired, and if they fail to receive early treatment, many of them later will have to be cared for in mental disease hospitals.

Still earlier in life are to be found countless children in our schools, our homes and some already in our juvenile courts, who display to the trained observer the signs of mental disease in the making. From a preventive point of view, obviously, most can be done with this latter group. For the great majority of them it is not yet too late to divert unhealthy personality traits and habits into more wholesome channels.

* As ascertained recently by the American Medical Association and others.

or to adjust the maladjusted so that tendencies towards delinquency (always a sure sign of maladjustment) or other anti-social displays of behavior may be corrected.

The difficulty in sidetracking towards health these potential victims of mental disorder is twofold: first is the obstacle of identifying them at an age when prophylactic measures can be applied with greatest hopes of success; second is the troublesome and highly complicated task of actually applying such measures. In the field of mental hygiene, identification of the potentially maladjusted means essentially *education*—education of physicians, nurses, social workers, teachers, and others, in the significance of symptoms that often enough are disguised as physical disorders, or are interpreted as manifestations of anything from "badness" or "sheer cussedness" to "original sin." It also means education of parents, for it is the fathers and mothers usually who, with excellent intentions, create the undesirable personality traits and difficulties that characterize the "problem" child. Public health workers will do well to bear in mind that "problem children mean problem parents."

Fortunately mental hygiene educational programs are increasing rapidly. For physicians and technical workers, fellowships and special training courses are being instituted in many of the larger medical centers. Psychiatry, with special emphasis on its social and community aspects, is making inroads on the curricula of numerous medical schools. For parents and the general public, parent-teacher organizations, mothers' clubs and similar agencies are conducting many courses of a non-technical nature designed to bring to their audiences some of the simpler and more firmly established facts about mental hygiene and child training.

The actual measures of attack, however, in a preventive program call for the highest professional skill and special training. Child guidance clinics and similar clinical agencies, when properly conducted, probably represent the highest point yet reached in the development of machinery for dealing with maladjusted children. By the same token they also represent one of the most complicated pieces of machinery. It is no simple matter to deal wisely and efficiently with "problem" children, although it is admitted there often has been given a deceptive coloring of simplicity to the description of certain pieces of work accomplished.

Physicians, social workers, and psychologists specially trained in psychiatric technic are indispensable for such clinics, and the case load (all too often the determining factor in other types of clinics) is bound to be low if good work is to result. Of course, there are some types of

mental hygiene clinics that serve a useful purpose as diagostic centers alone, but when treatment is included in a clinic's function, the number of cases to be effectively dealt with will necessarily remain small. This handicap has been surmounted in many of the larger child guidance clinics by making their educational possibilities second only in importance to their primary function of service to patients. Thus such clinics aid other case-working agencies in the community to acquaint individual workers with the methodology of child guidance work in order that numerous of the less complicated cases may in the future be handled directly by the non-psychiatric agency with a modicum of technical supervision. Under such a plan the low case load and comparatively high cost of a child guidance clinic are justified.

A fertile and responsive field awaits cultivation by public health workers who interest themselves in mental hygiene, especially at first in its educational aspects. The layman, often well informed about typhoid fever, diphtheria or hookworm, knows little of mental disorders, their prevention and their early treatment. To instruct him is not easy; there may be no baccili to show under the microscope; no change in the brain to demonstrate. The causes are complex and elusive; preventive measures will not bring immediate returns, but new weapons of attack have been forged; much technical information awaits public interpretation; and renewed hope that "Man's Last Specter—Mental Disease" may some day also be vanquished is warranted by the progress already made.

Courtesy of Chicago Daily News— CHICAGO DAILY NEWS SANATORIUM

CHICAGO—THE MEDICAL CENTER

CHICAGO'S medical institutions are among the most interesting and valuable places to be visited by public health workers, who attend the 57th Annual Meeting October 15-19. During the ten years which have passed since our last meeting in that city, vast strides have been made there not only in the development of institutions for medical treatment, education and training, but also in the facilities for and contributions to medical research of profound importance.

Long before Chicago attained prominence as a great industrial and commercial city, it became well known for achievement in the field of medicine by members of the faculty and staff of Rush Medical College, which was founded by the State of Illinois in 1837. Here Professor James V. Z. Blaney in 1847 first used "laughing gas" as an anesthetic, to be followed the next year by Professor Daniel Brainard in his successful use of chloroform.

MEDICAL SCHOOLS IN CHICAGO

Today Chicago has 4 Class A medical schools with an enrollment of students, graduating over 350 annually. These are:

1 Northwestern University School of Medicine

2 University of Chicago (Rush School of Medicine)

3 University of Illinois College of Medicine

4 Loyola University School of Medicine

On the McKinlock or downtown campus of Northwestern University and among a group of unique and modern educational buildings is the new Montgomery Ward Memorial Medical-Dental center which was opened last fall. It is housed in a mammoth 14 story building with 6 additional stories in the tower, and cost about $8,000,000 to erect and equip—the gift of the late Mrs. Montgomery Ward. This is the tallest educational building in the world. The architecture is modern Gothic in style, and the various units are thoroughly equipped for rendering splendid service to humanity. The first 7 floors house the medical school, the next 6 the dental school. The medical clinic which now occupies the lower 3 floors will later be incorporated in the new General Hospital and Clinic to be built on the campus immediately south.

The new Medical Unit recently completed at the University of Chicago is one of the best equipped medical institutions to be found anywhere, costing in the neighborhood of $5,000,000. It is located on the Midway on the University Campus, and is destined to be a center for medical education and research of far reaching importance and influence.

The College of Medicine of the University of Illinois has made rapid strides in recent years. The new campus is

located on Polk Street immediately adjacent to Cook County Hospital. When the projected additions to the present plant are completed, there will be a student capacity of approximately 800. The new buildings are of Gothic style in brick. The Research Hospital, the Research Laboratory, the Psychopathic Hospital and the Orthopedic Hospital have been completed. The Nurses Home is under construction; the student laboratories and dental infirmary, as well as the teaching amphitheatres are now being planned. At the present time the Research Hospital has approximately 150 beds available. The dispensary is one of the largest in the city and forms an invaluable aid for instruction of students in practical medicine. The library of the medical school is one of the largest in the country.

HOSPITAL FACILITIES IN CHICAGO

There are 135 hospitals of all types in greater Chicago, with a capacity of over 18,000 beds. About 80 per cent of these are operated for general hospital service. It is estimated that at the free medical and dental clinics in Chicago more than 200,000 of the city's poor are treated annually.

Cook County Hospital, with 3,000 beds, is one of the largest general hospitals in the world. It is the center of Chicago's well known medical center on the near west side. Of the private hospitals St. Luke's with 650 beds is the largest. This hospital in 1927 admitted approximately 15,000 patients, of which 4,153 were qualified free cases. There were over 30,000 visits to its outpatient department. Other large hospitals in the city are Michael Reese, Presbyterian, and Mercy. The last named was established in 1849 and has been to Chicagoans all that its name implies.

The Municipal Tuberculosis Sanitarium is the largest public organization of its kind anywhere, devoted to the control of a single disease. It is located on a 160-acre tract in the northwest section of the city and has at the present time capacity for 1,225 patients. It has the most modern laboratory, hospital and surgical treatment. As a special feature it has a division devoted exclusively to

Courtesy of Kaufmann & Fabry Co.

UNIVERSITY OF CHICAGO HOSPITAL

children suffering from tuberculosis. At its 8 dispensaries about 47,000 cases are registered for treatment at the present time, of which 3,000 are so-called open cases. The sanitarium has a staff of over 1,100 employes and a revenue from taxation of about $2,000,000 annually.

The Daily News Fresh Air Fund Sanitarium in Lincoln Park, where each year over 30,000 babies and about one-quarter as many mothers are treated, is a most interesting institution and worthy of study by all interested in child welfare work.

Of the strictly maternity hospitals, the Chicago Lying-In Hospital with its excellent facilities and dispensary service is the largest and probably best known in the city.

The Contagious Disease Hospital operated by the city under the supervision of the Health Department, is a 330-bed model isolation hospital with excellent equipment and doing a valuable health service.

The Chicago State Hospital for nervous and mental cases is operated by the State of Illinois. This is an institution which ranks among the best in America. It has about 3,000 beds.

The Illinois Central Hospital with 200-bed capacity is a splendid example of an industrial hospital.

Courtesy of Chicago Daily News and Aerial Photographic Service, Inc.

COOK COUNTY HOSPITAL AND THE GREAT WEST SIDE HOSPITAL GROUP

1. MAIN HOSPITAL BUILDING
2. NEW CHILDREN'S HOSPITAL
3. NEW MEN'S BUILDING
4. TUBERCULOSIS HOSPITAL
5. PSYCHOPATHIC HOSPITAL
6. NEW COUNTY MORGUE
7. UNIVERSITY OF ILLINOIS RESEARCH HOSPITAL
8. PRESBYTERIAN HOSPITAL
9. DURAND HOSPITAL
10. FRANCIS WILLARD HOSPITAL
11. RUSH MEDICAL COLLEGE
12. CHICAGO DENTAL COLLEGE
13. WEST SIDE HOSPITAL
14. UNIVERSITY OF ILLINOIS MEDICAL SCHOOL
15. WEST SIDE PROFESSIONAL SCHOOLS DEPARTMENT, Y. M. C. A.
16. PHILLIPSBORN BUILDING
17. ASHLAND AUDITORIUM

MEDICAL RESEARCH

Some very important medical research work is being conducted in Chicago hospitals and institutions of learning. The famous discovery of the Dick test for scarlet fever susceptibility and a preventive antitoxin was made by Drs. George and Gladys Dick at the McCormick Institute of Infectious Diseases.

Courtesy of Kaufmann & Fabry Co. MEDICAL-DENTAL BUILDING, NORTHWESTERN UNIVERSITY

At Cook County Hospital research work on diabetes, pernicious anemia, stomach ulcers, diseases of the heart, and the feeding of children were among the most important studies conducted last year.

In the investigative work of the scientific staff at the College of Medicine of the University of Illinois public health problems and disease prevention are emphasized. In coöperation with the State Department of Public Health, the college staff is carrying out a series of highly important studies dealing with the adjustment of the normal body to climatic conditions; with the State Psychopathic Institute the research staff of the college has developed a new method

and treatment for tabes and paresis. The Research Laboratory has an animal hospital with complete surgical facilities, an art department for medical illustrations and a plastic studio for research workers and clinicians.

At the Chicago Lying-In Hospital extensive studies on embryology are being conducted. Valuable investigations of the use of X-ray diagnosis in obstetrics are being carried out at Northwestern.

Among the more important pieces of research being conducted at the University of Chicago Medical School are those on the metabolism of nervous tissue, infantile paralysis, the value of crystallized protein in tuberculin in combating tuberculosis, and the electrical measurement of the virility of pneumonia germs.

St. Luke's Hospital maintains a research laboratory where probably more research work is done than in any private hospital of like size in America.

DR. SCHMIDT, CHAIRMAN OF A. P. H. A. CHICAGO LOCAL COMMITTEE

THE acceptance by Louis E. Schmidt, M.D., F.A.C.S., of the chairmanship of the Local Committee for the Fifty-seventh Annual Meeting is highly gratifying to all. Dr. Schmidt has for many years been an active worker for the advancement of public health and is known as a man who does big things well. He has already effected an organization from among our Chicago and middle west members which assures us of a most successful meeting.

Dr. Schmidt is Senior Attending Urologist at St. Luke's Hospital; Professor of Genito-urinary Surgery, Northwestern University Medical School; President and Chief of Staff, Illinois Social Hygiene League; and Consulting Urologist for Michael Reese and Grant Hospitals. During Dr. Bundesen's administration as Health Commissioner for Chicago Dr. Schmidt was in charge of the Bureau of Social Hygiene and also served as a consultant for the department. He has taken active interest in all types of public health work, especially venereal diseases, tuberculosis and cancer, and has given freely of his time in advancing this work through legislation, organization and administration.

Dr. Schmidt has been a member of the American Public Health Association since 1923. He is also a member of the American Clinical Association of Genito-Urinary Surgeons, American Urological Association and Chicago Urological Society, as well as International French and German Urological Associations.

Moffet Studio

LOUIS E. SCHMIDT, M.D.

Among those assisting Dr. Schmidt are: Arthur E. Gorman, Secretary, Isaac A. Abt, M.D., Volney S. Cheney, M.D., Thomas R. Crowder, M.D., Wm. A. Evans, M.D., Edwin O. Jordan, M.D., Arnold H. Kegel, M.D., Jacob M. Loeb, and Isaac H. Rawlings, M.D.

AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE, NEW YORK, N. Y.

COMMITTEES OF THE ASSOCIATION AND ITS SECTIONS, FOR THE ASSOCIATION YEAR 1927-1928

ASSOCIATION COMMITTEES

Committee on Administrative Practice

To study the administration of public health work, and to advise communities and public health organizations of the best methods for organizing and carrying on public health work in its several branches.

C.-E. A. Winslow, Dr.P.H., *Chairman* (1930), Yale University, New Haven, Conn.
Haven Emerson, M.D., *Vice-Chairman* (1930), 437 W. 59th St., New York, N. Y.
Louis I. Dublin, Ph.D., *Secretary* (1930), Metropolitan Life Ins. Company, New York, N. Y.
Michael M. Davis, Ph.D. (1931)
W. S. Rankin, M.D. (1931)
George D. Lummis, M.D. (1931)
George C. Ruhland, M.D. (1929)
Henry F. Vaughan, D.P.H. (1929)
Allen W. Freeman, M.D. (1929)
Charles V. Chapin, M.D. (1928)
W. F. Draper, M.D. (1928)
George T. Palmer, D.P.H. (1928)
A. J. Chesley, M.D. (1928)
C. Hampson Jones, M.D. (1928)
E. L. Bishop, M.D. (1928)
Homer N. Calver

Sub-Committees of Committee on Administrative Practice

Executive Committee

C.-E. A. Winslow, Dr.P.H., *Chairman,* Yale University, New Haven, Conn.
Louis I. Dublin, Ph.D., *Secretary,* Metropolitan Life Ins. Company, New York, N. Y.
Homer N. Calver

Record Forms

To devise standard record forms for the use of health departments, prepare the essential records only, and attempt to group these so that the facts can easily be taken from them for statistical purposes.

George C. Ruhland, M.D., *Chairman,* 419 City Hall, Syracuse, N. Y.
I. F. Thompson, M.D.
Ira V. Hiscock
George T. Palmer, D.P.H.
Walter M. Brunet, M.D.
Mary Brownell, R.N.
Merrill E. Champion, M.D.

Advisory Member

Jessamine Whitney

Industrial Health Service

To prepare a form for the collection of the essential data with respect to health conditions and health services of industries, and to keep in touch with progress in this field.

W. S. Rankin, M.D., *Chairman,* Johnston Bldg., Charlotte, N. C.
Leonard Greenburg, Ph.D., *Secretary,* Yale University, New Haven, Conn.
Lloyd Noland, M.D.
E. R. Hayhurst, M.D.
A. J. Lanza, M.D.

Public Health Nursing

To act in an advisory capacity on surveys and assist in formulating schedules for field studies and other record forms in which nursing service is involved.

Sophie C. Nelson, R.N., *Chairman,*

John Hancock Mutual Life Ins. Company, Boston, Mass.
Mary Laird, R.N.
Amelia Grant, R.N.
Jane C. Allen, R.N.

Rural Health Work

To prepare the Appraisal Form for Rural Health Work and its revision, at stated intervals. It is also supervising and directing a study of rural health work, which will be made during 1928 and 1929.

E. L. Bishop, M.D., *Chairman*, State Board of Health, Nashville, Tenn.
S. W. Welch, M.D.
John A. Ferrell, M.D.
Huntington Williams, M.D.
Joseph W. Mountin, M.D.
George T. Palmer, D.P.H.
W. S. Leathers, M.D.

Appraisal Form for State Health Work

To prepare an Appraisal Form for State Health Work along lines similar to the Appraisal Forms for City and Rural Health Work.

W. F. Draper, M.D., *Chairman*, U. S. Public Health Service, Washington, D. C. (To coopt members)

Revision of Appraisal Form for City Health Work

To revise the 1926 edition of the Appraisal Form and prepare the revised form for publication in 1929.

George T. Palmer, D.P.H., *Chairman*, 370 Seventh Ave., New York, N. Y.
James Roberts, M.D.
Allen W. Freeman, M.D.
E. L. Bishop, M.D.
George D. Lummis, M.D.
Henry F. Vaughan, D.P.H.
Philip S. Platt, Ph.D.

Organized Care of the Sick

To define the problems and guide the scope and methods of survey, which include studies of hospitals and other organized facilities for care of the sick.

Michael M. Davis, Ph.D., *Chairman*, 370 Seventh Ave., New York, N. Y.
George C. Ruhland, M.D.
Haven Emerson, M.D.
D. L. Richardson, M.D.
W. S. Rankin, M.D.

Advisory Members

William G. Norton
W. C. Rucker, M.D.

Model Health Ordinances

To prepare for publication an outline for a model health ordinance for the use of health officers.

Henry F. Vaughan, D.P.H., *Chairman*, Health Commissioner, Detroit, Mich.
Haven Emerson, M.D.
E. L. Bishop, M.D.
Huntington Williams, M.D.
James A. Tobey, Dr.P.H.

Standard Health Department Reports

To prepare an outline for Annual Health Department Reports with suggested tables and forms for presenting other pertinent data.

C. Hampson Jones, M.D., *Chairman*, Commissioner of Health, Baltimore, Md.
Ira V. Hiscock

Committee on Cancer

To consider the subject of cancer from a public health viewpoint.

George A. Soper, Ph.D., *Chairman*, 25 West 43d St., New York, N. Y.
George H. Bigelow, M.D.
Henry F. Vaughan, D.P.H.

Committee to Confer with American Medical Association

To confer on relationship of practice of medicine and public health work.

Herman N. Bundesen, M.D., Chicago Sanitary District, 910 S. Michigan Ave., Chicago, Ill.

Committee on Cleanliness and Health

To review the literature preparatory to planning future studies.

Ira V. Hiscock, *Chairman,* Yale University, New Haven, Conn.
F. P. Gorham
Edward S. Godfrey, Jr., M.D.

Committee on Census of Public Health Workers

To stimulate definitions of what constitutes public health workers and conduct a census of all workers who fall within the determined classifications.

John L. Rice, M.D., *Chairman,* Department of Health, New Haven, Conn.
John F. Norton, Ph.D.
Arthur E. Gorman
C. E. Turner
George H. Van Buren

Committee on Training and Personnel

To represent the Governing Council in the matter of public health education, and to make such recommendations as may appear pertinent to the interests intrusted to this committee.

C. E. Turner, *Chairman* (1930), Mass. Institute of Technology, Cambridge, Mass.
J. G. Fitzgerald, (1928)
W. H. Welch, M.D., (1929)
John Sundwall, M.D., (1931)
C.-E. A. Winslow, Dr.P.H., (1932)

Section Representatives:

John F. Norton, Ph.D.—*Laboratory*
Thomas F. Kenney, M.D.—*Health Officers*
W. J. V. Deacon, M.D.—*Vital Statistics*
Abel Wolman—*Public Health Engineering*
E. R. Hayhurst, M.D.—*Industrial Hygiene*
F. C. Blanck, Ph.D.—*Food, Drugs and Nutrition*
Walter S. Cornell, M.D.—*Child Hygiene*
E. G. Routzahn—*Public Health Education*
Gertrude Hodgman, R.N.—*Public Health Nursing*

Sub-Committee on Health Education in Colleges

John Sundwall, M.D., *Chairman,* University of Michigan, Ann Arbor, Mich.
M. P. Ravenel, M.D.
John W. Bowler, M.D.
Harold L. Lang
J. R. Earp, M.D.
H. G. Rowell, M.D.
Glenadine C. Snow, M.D.
Ethel Perrin
Lillian A. Hudson, R.N.

Sedgwick Memorial Medal Committee

To award annually for distinguished service a memorial medal commemorating Professor William T. Sedgwick.

M. J. Rosenau, M.D., *Chairman* (1930), 65 Naples Road, Coolidge Corner, Mass.
B. L. Arms, M.D. (1928)
Lee K. Frankel, Ph.D. (1928)
E. O. Jordan, Ph.D. (1929)
Robert Spurr Weston (1929)
M. P. Ravenel, M.D. (1931)
Charles V. Chapin, M.D. (1931)
Homer N. Calver, *Secretary* (1930), 370 Seventh Ave., New York, N. Y.

Committee on Eligibility

To recommend to the Governing Council the election of Honorary Fellows, applicants for Fellowship and of State Societies for affiliation, and to perform such other duties as may be assigned by the Governing Council.

Section Representatives:

Kenneth Allen (1928)—*Public Health Engineering*
C. E. Turner (1928)—*Child Hygiene*
Philip S. Platt, Ph.D. (1928)—*Public Health Education*
H. W. Redfield, Ph.D. (1929)—*Food, Drugs and Nutrition*
Wade Wright, M.D. (1929)—*Industrial Hygiene*
Frederick F. Russell, M.D. (1929)—*Laboratory*

W. J. V. Deacon, M.D. (1930)—*Vital Statistics*

F. J. Osborne (1930)—*Health Officers*

Alta E. Dines, R.N. (1930)—*Public Health Nursing*

Committee on Membership

To elect members, associate members and Sustaining Members.

(The Committee on Eligibility has been designated by the Executive Board as the Committee on Membership.)

Committee to Coöperate with Committees of the American Engineering Council and the American Society of Civil Engineers to Secure the Commissioning of Sanitary Engineers in the U. S. Public Health Service

George W. Fuller, *Chairman,* 170 Broadway, New York, N. Y.

George T. Palmer, D.P.H.

Sol Pincus

Haven Emerson, M.D.

Committee on Dairy Products

To develop a uniform and standard procedure for the necessary protection of public health in the production, processing and distribution of these commodities, and to develop in its work contact with all other agencies having similar aims.

Henry C. Sherman, *Chairman,* Columbia University, New York, N. Y.

William H. Park, M.D.

H. W. Redfield, Ph.D.

H. A. Whittaker

Isaac A. Abt, M.D.

William H. Welch, M.D.

Committee on Federal Health Legislation

To bring the matter of correlation to the attention of President Coolidge and appropriate committees of Congress, and to coöperate with other groups studying or promoting federal health correlation, and to represent the Association in all matters pertaining to federal health legislation.

Lee K. Frankel, Ph.D., *Chairman,* Metropolitan Life Ins. Co., New York, N. Y.

James A. Tobey, Dr.P.H.

Milton J. Rosenau, M.D.

S. J. Crumbine, M.D.

S. W. Welch, M.D.

C. Hampson Jones, M.D.

Committee on Finance

To assist the Treasurer in an advisory capacity.

Louis I. Dublin, Ph.D., *Chairman,* Metropolitan Life Ins. Company, New York, N. Y.

George W. Fuller

Michael M. Davis, Ph.D.

Editorial Committee

To assist and advise the Managing Editor of *The American Journal of Public Health.*

M. P. Ravenel, M.D., *Chairman,* University of Missouri, Columbia, Mo.

C. C. Young, D.P.H.

Louis I. Dublin, Ph.D.

E. R. Hayhurst, M.D.

James A. Tobey, Dr.P.H.

E. G. Routzahn

C.-E. A. Winslow, Dr.P.H.

Walter S. Frisbie

Merrill E. Champion, M.D.

Henry F. Vaughan, D.P.H.

Sophie C. Nelson, R.N.

Arthur P. Miller

Committee on Journal Advertising

To advise the Managing Editor in the acceptance of advertising.

Alec Thomson, M.D., *Chairman,* 1313 Bedford Ave., Brooklyn, N. Y.

Sally Lucas Jean

Charles V. Craster, M.D.

Council on Standards

To act upon reports involving standards submitted to it by the Governing Council.

George W. Fuller, *Chairman* (1931), 170 Broadway, New York, N. Y.

Henry F. Vaughan, D.P.H., *Vice-Chairman* (1928), Commissioner of Health, Detroit, Mich.
Haven Emerson, M.D. (1929)
E. O. Jordan, Ph.D. (1930)
Merrill E. Champion, M.D. (1932)

Committee on Permanency of Tenure

To take an active part in changing the method of appointments of health officers and in securing for them permanency of tenure.

S. J. Crumbine, M.D.
Matthias Nicoll, Jr., M.D.
W. H. Howell, M.D.
John L. Rice, M.D.

Committee to Coöperate with Director of Census

To act as an advisory committee to coöperate with the Director of the Census in regard to vital statistics.

Charles V. Chapin, M.D., *Chairman,* Superintendent of Health, Providence, R. I.
Haven Emerson, M.D., *Secretary,* 437 W. 59th St., New York, N. Y.
Irving Fisher, Ph.D.

Committee on Ventilation

To study the relationship of ventilation to health, particularly in schools.

Louis I. Harris, M.D., *Chairman,* Commissioner of Health, New York, N. Y.
Thomas Duffield—*Public Health Engineering Section*
Joel I. Connolly—*Public Health Engineering Section*
Leonard Greenburg, Ph.D.—*Industrial Hygiene Section*
C.-E. A. Winslow, Dr.P.H.—*Industrial Hygiene Section*
S. Josephine Baker, M.D.—*Child Hygiene Section*
Charles H. Keene, M.D.—*Child Hygiene Section*

Committee on Chautauqua Health Program

To represent the Association in the organization of a rural health program in coöperation with Chautauqua systems, the Milbank Memorial Fund and others.

S. J. Crumbine, M.D., *Chairman,* 370 Seventh Ave., New York, N. Y.
H. E. Kleinschmidt, M.D.
Bertrand Brown
E. H. Marsh, M.D.
Donald B. Armstrong, M.D.

Temporary Organizing Committee for the West

To develop organization and to advise on problems particularly affecting the Western members of the A. P. H. A.

W. C. Hassler, M.D., *Chairman,* Department of Health, San Francisco, Calif.
E. T. Hanley, M.D., *Vice-Chairman,* 300 Public Safety Building, Seattle, Wash.
John J. Sippy, M.D., *Secretary,* Health Department, Stockton, Calif.
J. L. Pomeroy, M.D.
George Parrish, M.D.
Robert A. Peers, M.D.
H. B. Hommon
William P. Shepard, M.D.
H. E. Young, M.D.
F. D. Stricker, M.D.
W. F. Cogswell, M.D.

Advisory Member

James J. Waring, M.D.

Central Program Committee

To prepare programs for annual and other meetings of the Association and to establish standards for these programs.

Herman N. Bundesen, M.D., *President,* 910 S. Michigan Ave., Chicago, Ill.
Homer N. Calver, *Secretary,* 370 Seventh Ave., New York, N. Y.

Section Representatives:

C. C. Young, D.P.H.—*Laboratory*
C. Hampson Jones, M.D.—*Health Officers*
George H. Van Buren—*Vital Statistics*

Arthur E. Gorman—*Public Health Engineering*
Eugene L. Fisk, M.D.—*Industrial Hygiene*
J. H. Shrader, Ph.D.—*Food, Drugs and Nutrition*
H. H. Mitchell, M.D.—*Child Hygiene*
Ira V. Hiscock—*Public Health Education*
Mary Laird, R.N.—*Public Health Nursing*

SECTION COMMITTEES AND SECTION COUNCILS

The following is a list of the section committees. Where information has been supplied by the section secretaries an indication of the purpose of the committee is given.

HEALTH OFFICERS SECTION

Section Council

C. Hampson Jones, M.D., *Chairman*, Commissioner of Health, Baltimore, Md.
A. J. Chesley, M.D., *Vice-Chairman*, Old Capitol, St. Paul, Minn.
E. L. Bishop, M.D., *Secretary*, State Health Commissioner, Nashville, Tenn.
Alton S. Fell, M.D. (1928)
Louis I. Harris, M.D. (1928)
A. J. Douglas, M.D. (1928)
F. G. Curtis, M.D. (1929)
James Roberts, M.D. (1929)
H. L. Rockwood, M.D. (1929)

LABORATORY SECTION

Section Council

C. C. Young, D.P.H., *Chairman*, Department of Health Laboratory, Lansing, Mich.
W. H. Frost, M.D., *Vice-Chairman*, 615 N. Wolfe St., Baltimore, Md.
W. D. Stovall, M.D., *Secretary*, State Hygienic Laboratory, Madison, Wis.
Leonard M. Wachter (1928)
Friend Lee Mickle (1928)
E. Marion Wade (1929)
T. G. Hull (1929)

Committee on Standard Methods

E. O. Jordan, Ph.D., *Chairman* (1929), University of Chicago, Chicago, Ill.
John F. Norton, Ph.D., *Secretary* (1929), University of Chicago, Chicago, Ill.
Norman MacL. Harris, M.B. (1929)
Roger G. Perkins, M.D. (1928)
William H. Park, M.D. (1928)
George W. McCoy, M.D. (1928)
W. H. Frost, M.D. (1930)
Leonard M. Wachter (1930)
Augustus B. Wadsworth, M.D. (1930)

Referees

A. M. Buswell, *Chemical Water Analysis*
Chester T. Butterfield, *Bacterial Water Analysis*
W. C. Purdy, *Microscopical Water Analysis*
Robert S. Breed, Ph.D., *Bacterial Milk Analysis*
F. P. Gorham, *Shellfish Analysis*
G. F. Reddish, Ph.D., *Methods for Testing Disinfectants*
T. R. Crowder, M.D., *Air Analysis*
W. A. Manheimer, *Bacterial Examination of Swimming Pools*
S. DeM. Gage, *Chemical Examination of Swimming Pools*
Anna W. Williams, M.D., *Diagnosis of Diphtheria—including virulence, intracutaneous tests, etc.*
Ruth Gilbert, M.D., *Wassermann Test*

Committee to Confer with A. P. H. A. Committee on Dairy Products

Robert S. Breed, Ph.D., *Chairman*, N. Y. Agricultural Experiment Station, Geneva, N. Y.
S. H. Ayers
W. D. Dotterrer

Committee on Appraisal Form

Friend Lee Mickle, *Chairman,* State Department of Health, Hartford, Conn.
C. C. Young, D.P.H.
Ruth Gilbert, M.D.
Aubrey H. Straus
E. K. Kline, Dr.P.H.

Committee on Abstracts in the Journal

C. C. Young, D.P.H., *Chairman,* Department of Health Laboratory, Lansing, Mich.
Ruth Gilbert, M.D.
I. S. Falk, Ph.D.
W. D. Dotterrer
Charles Krumwiede, Jr., M.D.

Committee on Program

C. C. Young, D.P.H., *Chairman,* Department of Health Laboratory, Lansing, Mich.
W. D. Stovall, M.D.
Friend Lee Mickle

Committee to Draw Up Curriculum in the Education of Laboratory Workers

C. C. Young, D.P.H., *Chairman,* Department of Health Laboratory, Lansing, Mich.
W. R. Stokes, M.D.
T. G. Hull

VITAL STATISTICS SECTION

Section Council

George H. Van Buren, *Chairman,* Metropolitan Life Ins. Company, New York, N. Y.
F. M. Register, M.D., *Vice-Chairman,* Bureau of Vital Statistics, Raleigh, N. C.
John O. Spain, *Secretary,* Bureau of the Census, Washington, D. C.
E. S. MacPhail (1928)
W. A. Plecker, M.D. (1928)
Haven Emerson, M.D. (1929)
W. Thurber Fales, Sc.D. (1929)

Committee on Forms and Methods of Statistical Practice

To suggest revised standard certificates of births and deaths for each decade and outline a few standard tables to promote uniformity in the presentation of data.

William H. Davis, M.D., *Chairman,* Bureau of the Census, Washington, D. C.
William H. Guilfoy, M.D.
Sheldon L. Howard
F. M. Register, M.D.
J. V. DePorte, Ph.D.
A. W. Hedrich

Committee On Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List

To study the reliability of statements of causes of death and make recommendations concerning the decennial revision of the International List.

Haven Emerson, M.D., *Chairman,* 437 West 59th St., New York, N. Y.
William H. Guilfoy, M.D.
E. H. Lewinski-Corwin, Ph.D.
Louis I. Dublin, Ph.D.
Charles Norris, M.D.
William H. Davis, M.D.
George H. Van Buren
Wilmer R. Batt, M.D.
W. J. V. Deacon, M.D.
John O. Spain

Advisory Members

W. T. Longcope, M.D.
W. R. Williams, M.D.

Committee on Registration Affairs

To report on the progress made in the registration of births and deaths.

William H. Davis, M.D., *Chairman,* Bureau of the Census, Washington, D. C.
Carl F. Raver, M.D.
Stewart G. Thompson, D.P.H.
W. Thurber Fales, Sc.D.
A. A. Whittemore, M.D.

Committee on Public Health Climatology

To review studies of the influence of climate on health and encourage increased efforts in this field.

E. W. Kopf, *Chairman,* Metropolitan Life Ins. Company, New York, N. Y.

Kenneth Allen
John S. Fulton, M.D.
Lowell J. Reed, Ph.D.
I. S. Falk, Ph.D.
Advisory Member
R. B. Watson

Committee on Contributory Causes of Death

To analyze statistics on this subject and study methods in selecting the contributory cause in cases where three or more causes are reported on the same death certificate.

George H. Van Buren, *Chairman*, Metropolitan Life Ins. Company, New York, N. Y.
John O. Spain
W. A. Plecker, M.D.
John W. Trask, M.D.
M. O. Heckard, M.D.
Stewart G. Thompson, D.P.H.
Advisory Member
Albert G. Love

Committee on Vital Statistics Training

To serve principally in an advisory capacity for any person seeking information regarding a course of instruction in vital statistics.

W. J. V. Deacon, M.D., *Chairman*, Dept. of Health, Lansing, Mich.
Raymond Pearl, Ph.D.
C.-E. A. Winslow, Dr.P.H.
Edwin W. Kopf
William H. Davis, M.D.
James S. Elston

Committee to Aid Completion of Registration Area Before 1930

To make extensive efforts to improve the registration of births and deaths in states where the registration is not now up to the standard required for admission into the registration area.

Louis I. Dublin, Ph.D., *Chairman*, Metropolitan Life Ins. Company, New York, N. Y.
Frederick L. Hoffman, LL.D.
William H. Davis, M.D.
Wilmer R. Batt, M.D.
Blanche M. Haines, M.D.
R. C. Williams, M.D.
Advisory Members
Jessamine S. Whitney
W. R. Redden, M. D.
George W. Ehler

Committee on Joint Causes of Death

To consider ways of improving and making more uniform the methods used in selecting one cause of death from a group of two or more causes reported on the same death certificate

William H. Davis, M.D., *Chairman*, Bureau of the Census, Washington, D. C.
George H. Van Buren
William H. Guilfoy, M.D.
John O. Spain

Committee on Proper Allocation of Records

To consider the working out of a plan whereby births and deaths will be charged according to the usual place of abode instead of the place of birth or death.

J. V. DePorte, Ph.D., *Chairman*, N. Y. State Department of Health, Albany, N. Y.
William H. Davis, M.D.
Stewart G. Thompson, D.P.H.
W. J. V. Deacon, M.D.
Walter F. Willcox, Ph.D.
William H. Guilfoy, M.D.
George H. Van Buren

FOOD, DRUGS AND NUTRITION SECTION

Section Council

J. H. Shrader, Ph.D., *Chairman*, 901 Municipal Building, Baltimore, Md.
Henry C. Sherman, *Vice-Chairman*, Columbia University, New York, N. Y.
Carl R. Fellers, Ph.D., *Acting Secretary*, Massachusetts Agricultural College, Amherst, Mass.
J. C. Geiger, M.D. (1928)
Carl R. Fellers, Ph.D. (1928)
Harry W. Redfield, Ph.D. (1929)

Committee on Beverages

All beverages except milk are con-

sidered as falling within the scope of this committee. Sanitation, adulteration, food value, container sterilization, and methods of manufacture and laboratory examination of beverages are considered.

T. J. King
M. J. Dooling, D.V.M.

Committee on Fruits, Vegetables and Their Products

Raw and preserved fruits and vegetables, as well as their products may properly be considered under this committee. The public health aspects of the production, transportation, marketing and consumption of raw, canned, dried or refrigerated fruits and vegetables are very important.

Henry M. Loomis, *Chairman*, 1739 H. St., Washington, D. C.
Carl R. Fellers, Ph.D.
Chester A. Darling, Ph.D.

Committee on Cereals and Their Products

The production, manufacture, distribution, food value, adulterations, bacteriological and chemical studies of cereals and such products as flour, starch, malted and prepared breakfast foods and their public health aspects are important.

F. C. Blanck, Ph.D., *Chairman*, Bureau of Chemistry, Washington, D. C.
E. V. McCollum, Ph.D.
D. B. Jones, Ph.D.

Committee on Meat, Fish and Shellfish

The usual health aspects of meats, fish and shellfish, such as sanitation, disease transmission, purity, decomposition, food value and laboratory examination are of the greatest importance in the work of this committee.

Carl R. Fellers, Ph.D., *Chairman*, Mass. Agricultural College, Amherst, Mass.
F. A. Korff
A. C. Hunter, Ph.D.

Committee on Dairy Products and Eggs

Milk, butter, ice cream, cheese, milk drinks, malted milk, evaporated and condensed milk, dried milk powders, baby preparations, shell eggs, frozen and desiccated eggs and all kinds of egg preparations properly come within the scope of this committee.

Harry W. Redfield, Ph.D., *Chairman*, R. F. D. No. 1, Mendham, N. J.
D. B. Peck, M.D.
E. M. Pickens, D.V.M.
Martin J. Prucha, Ph.D.
W. B. Palmer
W. H. Price, M.D.

Committee on Nutritional Problems

The food value, calorific, vitamin, and other basic studies on all kinds of foods; effect of adulterants, minerals, etc., on food value; nutritional diseases and metabolism disturbances are the problems of this committee.

Henry C. Sherman, *Chairman*, Columbia University, New York, N. Y.
E. L. Fisk, M.D.
D. B. Jones, Ph.D.
T. P. B. Jones
C.-E. A. Winslow, Dr.P.H.

PUBLIC HEALTH ENGINEERING SECTION

Section Council

Arthur E. Gorman, *Chairman*, 6743 Olympia Ave., Chicago, Ill.
Stephen DeM. Gage, *Vice-Chairman*, 310 State House, Providence, R. I.
George W. Putnam, *Secretary*, Department of Health, Chicago, Ill.
Clarence M. Baker (1928)
Abel Wolman (1928)
Charles G. Hyde (1928)
E. Sherman Chase (1929)
J. F. Skinner (1929)

Committee on Scope and Policy

R. S. Weston, *Chairman* (1932), 14 Beacon St., Boston, Mass.
Earle Waterman (1928)
W. F. Wells (1929)

V. M. Ehlers (1930)
Abel Wolman (1931)

Committee on Committees
William H. Dittoe, *Chairman*, (1932), Mahoning Valley Sanitary District, Youngstown, O.
Theodore J. LaFreniere (1928)
Charles G. Hyde (1929)
Langdon Pearse (1930)
H. E. Miller (1931)

Committee on Membership
Abel Wolman, *Chairman* (1932), 16 W. Saratoga St., Baltimore, Md.
Carl Speer, Jr., *Secretary*, 7516 Colfax Ave., Chicago, Ill.
George W. Hazelhurst (1928)
Charles G. Hyde (1929)
George W. Fuller (1930)
Joseph W. Ellms (1931)

Committee on Bathing Places
Stephen DeM. Gage, *Chairman*, 310 State House, Providence, R. I.
Harry F. Ferguson
Jack J. Hinman, Jr.
George W. Simons, Jr.
E. S. Tisdale

Committee on Mosquito Control
L. E. Jackson, *Chairman*, 921 Bergen Ave., Jersey City, N. J.
E. L. Filby
E. H. Gage
George H. Hazelhurst
A. E. Skinner
W. H. Van Hovenberg

Committee on Sewage Disposal
John F. Skinner, *Chairman*, 52 City Hall, Rochester, N. Y.
Frank Bachmann
C. K. Calvert
Harrison P. Eddy
C. P. Hoover
Langdon Pearse
Willem Rudolfs

Committee on Waterways Pollution
F. H. Waring
Ernest Boyce
A. L. Fales
J. K. Hoskins
William L. Stevenson
L. F. Warrick
A. H. Wieters

Committee on Water Supply
John R. Baylis, *Chairman*, 1643 E. 86th St., Chicago, Ill.
C. R. Cox
Joseph W. Ellms
C. A. Emerson, Jr.
Homer Knouse
W. H. Streeter

Committee on Rural Sanitation
A. Clinton Decker, *Chairman*, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
G. H. Ferguson
Paul S. Fox
Harry B. Hommon
W. Scott Johnson
Willard M. Olson
Harold A. Young

Committee on Refuse Collection and Disposal
Kenneth Allen, *Chairman*, Municipal Bldg., New York, N. Y.
M. N. Baker
S. A. Greeley
C. A. Holmquist
W. T. Knowlton
E. D. Rich
L. E. Williams

Committee on Education and Training
Abel Wolman, *Chairman*, 16 W. Saratoga St., Baltimore, Md.
Charles G. Hyde
W. C. Hoad
I. W. Mendelsohn
Arthur P. Miller
Ernest W. Steel
R. S. Weston

Committee on Milk Supply
H. A. Whittaker, *Chairman*, State Board of Health, Minneapolis, Minn.
Leslie W. Frank
C. A. Holmquist
R. E. Irwin
H. D. Pease, M.D.
George W. Putnam

INDUSTRIAL HYGIENE SECTION

Section Council

Eugene L. Fisk, M.D., *Chairman*, 25 W. 43d St., New York, N. Y.
Frank L. Rector, M.D., *Vice-Chairman*, 823 Case St., Evanston, Ill.
Emery R. Hayhurst, M.D., *Secretary*, Ohio State University, Columbus, O.
A. J. Lanza, M.D. (1928)
T. R. Crowder, M.D. (1928)
Volney S. Cheney, M.D. (1929)
Carey P. McCord, M.D. (1929)
George M. Price, M.D. (1929)
Elizabeth B. Bricker, M.D. (1929)

Committee on Industrial Anthrax

To keep close watch on human anthrax in America and report to the Section.

Henry F. Smyth, M.D., *Chairman*, University of Pennsylvania, Philadelphia, Pa.
Volney S. Cheney, M.D.
S. Dana Hubbard, M.D.
Stanley H. Osborn, M.D.

Committee on Industrial Morbidity Statistics

To report at the Annual Meetings.

Wade Wright, M.D., *Chairman*, Metropolitan Life Ins. Company, New York, N. Y.
Frank L. Rector, M.D.
George H. Van Buren

Committee to Assist in Extension of Interstate Control of Poisons and Hazardous Substances Other Than Foods

Henry F. Smyth, M.D., *Chairman*, University of Pennsylvania, Philadelphia, Pa.
Leonard Greenburg, Ph.D.
Frank L. Rector, M.D.

Committee on Standard Practices in the Problem of Compensation of Occupational Diseases

A. J. Lanza, M.D., *Chairman*, Metropolitan Life Ins. Company, New York, N. Y.
Henry K. Kessler, M.D.
Bernard S. Coleman
George M. Price, M.D.
May R. Mayer, M.D.
Elizabeth B. Bricker, M.D.
R. R. Sayres, M.D.
E. R. Hayhurst, M.D.
J. G. Cunningham

Committee on Lead Poisoning

To report annually to the Section on the status and control of lead poisoning.

Carey P. McCord, M.D., *Chairman*, 62 Groton Bldg., Cincinnati, O.
Robert A. Kehoe, M.D.

Committee on Industrial Fatigue

To report at the Annual Meetings.

Eugene L. Fisk, M.D., *Chairman*, 25 West 43d St., New York, N. Y.
Wade Wright, M.D.
Derric C. Parmenter, M.D.
L. R. Thompson, M. D.
Frederick B. Flinn
E. R. Hayhurst, M.D.

Committee on Volatile Solvents

To report at the Annual Meetings.

Alice Hamilton, M.D., *Chairman*, Harvard School of Public Health, Boston, Mass.
Elizabeth B. Bricker, M.D.

Committee on Silicosis

To report at the Annual Meetings.

E. R. Sayres, M.D., *Chairman*, U. S. Bureau of Mines, Washington, D. C.
E. R. Hayhurst, M.D.
A. J. Lanza, M.D.

Committee on Skin Irritants

To report at the Annual Meetings.

Henry F. Smyth, M.D., *Chairman*, University of Pennsylvania, Philadelphia, Pa.

CHILD HYGIENE SECTION

Section Council

Harold H. Mitchell, M.D., *Chairman*, 370 Seventh Ave., New York, N. Y.
J. H. Mason Knox, M.D., *Vice-Chairman*, 16 W. Saratoga St., Baltimore, Md.

Carl E. Buck, Dr.P.H., *Secretary*, Dept. of Health, Detroit, Mich.
Sally Lucas Jean (1928)
Harold DeW. Cross, M.D. (1928)
Francis Hollingshead, M.D. (1928)
J. T. Phair, M.B. (1929)
Thomas A. Storey, M.D. (1929)
C. F. Wilinsky, M.D. (1929)

Committee to Study and Report on the Problem of Infant and Maternal Mortality

To study the various causes of infant and maternal mortality, why these causes exist and methods which may tend to eliminate them.

Julius Levy, M.D., *Chairman*, 66 Baldwin Ave., Newark, N. J.
J. H. Mason Knox, M.D.
Blanche Haines, M.D.
Lee K. Frankel, Ph.D.
Lester Evans, M.D.
Miriam Ames, R.N.
Dorothy Holland, Ph.D.

Committee on School Health Problems

To deal with problems affecting school health service which might arise during the course of the year and demand some expression of opinion from the Child Hygiene Section.

Carl E. Buck, Dr.P.H., *Chairman*, Dept. of Health, Detroit, Mich.
George P. Barth, M.D.
Harris R. C. Wilson, D.D.S.
Maud Brown
Mary S. Rose, Ph.D.

PUBLIC HEALTH EDUCATION SECTION

Section Council

Ira V. Hiscock, *Chairman*, Yale University, New Haven, Conn.
Marjorie Delavan, *Vice-Chairman*, State Department of Health, Lansing, Mich.
John Sundwall, M.D., *Secretary*, University of Michigan, Ann Arbor, Mich.
Raymond S. Patterson, Ph.D. (1928)
Ira V. Hiscock (1928)
Ray H. Everett (1928)
Philip S. Platt, Ph.D. (1929)
Evart G. Routzahn (1929)

Committee on Health Education, Institutes and Group Discussion

Evart G. Routzahn, *Chairman*, 130 E. 22d St., New York, N. Y.
Raymond S. Patterson, Ph.D.
Iago Galdston, M.D.
Philip S. Platt, Ph.D.
Mary Swain Routzahn
Ira V. Hiscock

Committee on Appraisal Form

Philip S. Platt, Ph.D., *Chairman*, N. Y. Tuberculosis & Health Association, New York, N. Y.
Evart G. Routzahn
Iago Galdston, M.D.

PUBLIC HEALTH NURSING SECTION

Section Council

Mary Laird, R.N., *Chairman*, 70 N. Water St., Rochester, N. Y.
Elizabeth Stringer, R.N., *Vice-Chairman*, 80 Schermerhorn St., Brooklyn, N. Y.
Margaret K. Stack, R.N., *Secretary*, 53 Imlay St., Hartford, Conn.
Sophie C. Nelson, R.N. (1928)
Anne L. Hansen, R.N. (1928)
Grace Ross, R.N. (1929)
Anne Ewing, R.N. (1929)

Committee to Study Lay Committees for Official Public Health Nursing Organizations

To study the usefulness, function, constitution and appointment of Advisory Committees on Public Health Nursing, such committees to be advisory to the Public Health authorities.

Health Officers' Section
F. X. Mahoney, M.D.
Henry F. Vaughan, D.P.H.
C. C. Slemons, M.D.

Lay Members
Mrs. George C. Hunter
Mrs. Frederick S. Roth
James A. Tobey, Dr.P.H.

Nurse Members
Mrs. Elsbeth Vaughan
Mary S. Gardner
Elizabeth G. Fox, R.N.

ASSOCIATION NEWS

DR. GEIGER RETURNS TO CALIFORNIA

J. C. Geiger, M.D., formerly epidemiologist of the U. S. Public Health Service and Assistant Commissioner of Health in Chicago, Ill., has been appointed Associate Professor of Epidemiology in the University of California Medical School and Hooper Foundation for Medical Research. During 1913-1916 Dr. Geiger was epidemiologist for the California State Board of Health. While in Chicago, Dr. Geiger also served on the faculty of the University of Chicago.

Dr. Geiger is a Fellow of the A.P.H.A. and a member of the council of the Food, Drugs & Nutrition Section. He has made valuable contributions to the research field on botulism and food poisoning.

DR. WILINSKY HONORED

Friends of Dr. Charles F. Wilinsky gave a dinner in his honor in Boston, Mass., the evening of May 22. The occasion was Dr. Wilinsky's appointment as director of the new Beth Israel Hospital, Boston. He has taken a leave of absence from the Health Department where he has been serving as Deputy Health Commissioner, and he has resigned as president of the Boston Health League. Dr. Wilinsky is a Fellow of the A.P.H.A.

Dr. George Bigelow was a stimulating and gracious toastmaster. Brief addresses were made by those who have been associated with Dr. Wilinsky in his work in the Health Department, the Health League, the Medical Society, and in the new hospital.

Ex-Mayor Curley on behalf of his friends, presented Dr. Wilinsky with a magnificent colonial clock.

DR. BINGHAM DIES

Arthur Wallace Bingham, M.D., president of the medical board of the Willard Parker Hospital, New York, N. Y. for the last 5 years, and since 1923 a member of the A.P.H.A. died June 10 at his home in New York City of heart disease after an illness of 3 months. Dr. Bingham was 55 years old. He was graduated from Yale University in the class of 1896 and later obtained his medical degree from the College of Physicians and Surgeons, Columbia University. For 10 years he was visiting surgeon to Willard Parker Hospital. Dr. Bingham received high commendation from the public health committee of the New York Academy of Medicine in its report of 1925 for his success in the care of contagious diseases. The May, 1927, issue of the *American Journal of Public Health* carried an article by Dr. Bingham, "Community Control of the Acute Infections," written in collaboration with Joseph J. Gallagher.

NEW MEMBERS

Selma I. Akerfelt, R.N., Fairfield, Conn., Supervisor Fairfield Visiting Nurse Association

James A. Bauman, Ph.G., Ridgewood, N. J., in charge of Ridgewood Analytical and Clinical Laboratory

Frederick J. Biele, C.E., Huntington, N. Y., Consulting Sanitary Engineer

Homer W. Borst, M.A., Indianapolis, Ind., Executive Secretary, Indianapolis Community Fund (Assoc.)

Philip Burgess, B.S., Columbus, O., Civil and Sanitary Engineer

Margaret Butler, R.N., Chicago, Ill., Superintendent of Nurses, Department of Health

Julia D. Clock, R.N., Howell, Mich., Livingston County Nurse

Samuel Cochran, M.D., Lawrenceville, N. J., Head of Medical Department, Lawrenceville School

Mary P. Connolly, Detroit, Mich., Supervisor

of Health Education, Department of Health
Alma A. Dobbs, M.A., Los Angeles, Calif., Assistant Director Physical Education, Los Angeles City Schools
Eri M. Farr, M.D., Billings, Mont., Health Officer, Yellowstone County
William J. Fleming, M.D., Troy, N. Y., Health Officer
Joseph M. Ginsburg, Ph.D., New Brunswick, N. J., Mosquito Control Work, Agricultural Experiment Station
John G. Graham, Accomac, Va., Sanitation Officer, State Board of Health
W. H. Gooch, M.D., Elmer, Mo., County Health Commissioner
Philip G. Hasell, B.S., Columbia, S. C., Sanitary Engineer, State Board of Health
Melvin P. Hatcher, B.S., Kansas City, Mo., Sanitary Engineer with Burns and McDonnell Engineering Company
Lee Swee Hock, M.S.D.S., Kuching, Sarawak, Borneo, Senior Sanitary Inspector (Assoc.)
Hou-Ki Hu, M.D., Shanghai, China, Commissioner of Public Health (Assoc.)
Alma I. Johnson, R.N., Orono, Me., Nurse, University of Maine Health Service
Richard H. Jones, B.S., Lansing, Mich., Welfare and First Aid Work at the Novo Engine Company (Assoc.)
Peter Kasius, A.B., L.L.B., St. Louis, Mo., Executive Secretary, Missouri Social Hygiene Association
Clarence M. Keckler, B.S., Red Bank, N. J., Chemist and Bacteriologist, Monmouth Consolidated Water Company
Chang-Sei Kim, M.D., Dr.P.H., Shanghai, China, Field Director, Council on Health Education (Assoc.)
Adde C. Kimpton, Mexico, Mo. (Assoc.)
W. G. Kirchoffer, Madison, Wis., Sanitary Engineer
Pearl L. Laptad, R.N., St. Louis, Mo., Field Nurse, American Red Cross
Guy G. Lunsford, M.D., Ph.G., Cordele, Ga., Commissioner of Health, Crisp County
Harry D. McBride, St. Louis, Mo., Vice President, St. Louis Tuberculosis and Health Society (Assoc.)
Francisco G. Moctezuma, Mexico, D.F., Mex., Sanitary Inspector, Public Health Dept.
George I. Nelson, St. Louis, Mo. (Assoc.)
Hibberd R. Norman, Norwich, Conn., Health Officer, New London County
Ardzroony Packchanian, New York, N. Y., Research Bacteriologist
B. Ananthaswamy Rao, B.S., M.B., New York, N. Y., Student at Harvard School of Public Health (Assoc.)
John C. Sager, B.S., Chicago, Ill., Junior Engineer, Sanitary District of Chicago
Sara A. Scudder, New York, N. Y., Bacteriologist for Bellevue-Yorkville Health Demonstration
Lon Sharp, Springfield, Mo., Commissioner of Health and Sanitation
William F. Sheehan, Williamsville, N. Y., Sanitary Engineer
James W. Simmons, Cape Charles, Va., Sanitary Officer, Northampton County
George R. Spalding, Oradell, N. J., Secretary, Health Board
E. B. Swerdfeger, M.D., Denver, Colo. (Assoc.)
William G. Taylor, Newark, N. J., Sanitary Engineer
Francis M. Veatch, B.S., C.E., Kansas City, Mo., Designer of Water Purification and Sewage Disposal Works
Aurel Voina, M.D., Bucharest, Roumania, Assistant Director, Ministry of Health and Public Welfare (Assoc.)
John W. Waters, Cambridge, Mass., Director of Physical Education, Y. M. C. A.
James E. Williamson, South Orange, N. J., Designer and Builder of Water Purification Works
Luciele A. Withers, R.N., Las Vegas, Nev., formerly doing public health work in China, and Nursing Representative for American Red Cross
Tillie Witt, R.N., Benton, Mo., County Public Health Nurse
Thomas F. Wolfe, Chicago, Ill., Research Engineer, Cast Iron Pipe Research Association
James B. Woods, M.D., M.A., Smithfield, Va., Director Health Unit, Isle of Wight County
Alexander H. Zimmerman, B.S., Chicago, Ill., Ventilation Engineer, Department of Health

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Program Following Mississippi Flood—The total area affected in the spring of 1927 by the flood waters of the Mississippi and its tributaries represents 20,000 square miles inhabited by approximately 908,200 people. Emergency sanitation was provided by the American Red Cross in 149 concentration camps caring for 330,000 people. Assistance was rendered by the various state health departments, U. S. Public Health Service, the Rockefeller Foundation, and by neighboring states. It is estimated that in all the states in the flooded area 469,442 individuals were immunized against typhoid fever, receiving three inoculations, and 137,340 individuals were vaccinated against smallpox, before July 1, 1927.

During the spring and early summer of 1927 an effort was made to control malaria by means of screening the homes of malaria carriers. Nearly 7000 homes were screened in a period of approximately 90 days.

Since July, 1927, 78 counties have established health departments, and over 200 full-time health workers have been employed in such departments. Training schools were organized for the practical teaching of field public health work to prospective health officers, nurses and inspectors. The principal school was located at Indianola, Miss. The health program in each case was instituted along the same standard lines as enjoyed elsewhere.

The diseases which showed the greatest increase during the postflood period were pellagra and malaria. To combat the increase in pellagra dried brewer's yeast was distributed, and to control malaria the screening of homes occupied by carriers was attempted, as was likewise, the free distribution of quinine.—J. G. Townsend, The Full Time County Health Program Developed in the Mississippi Valley Following the Flood. *Pub. Health, Rep.*, 43: 1199, (May 18), 1928.

Rabies Control in Kansas City—The Health Department in Kansas City, Mo., immunized, free of charge, from January 27, 1927, to April 1, 1928, 19,486 dogs. There were immunized by the veterinarians in this city, perhaps, 5,000 or 6,000 dogs. We have used the single injection method. Two hundred and eighty persons were given antirabic treatment in our clinic in 1925; 331 in 1926; 132 in 1927, and 12 the first 4 months of 1928. Our laboratory made the examination of 189 heads in 1926; 150 in 1927, and 5 in the first 4 months of 1928.

Our Department of Inspection and Sanitation, in coöperation with the laboratory and veterinary department, have recently completed a study or recheck and it is their opinion that the single injection is very successful and the cases of rabies developing in animals, after treatment, are practically unknown to this department. We have 2 reported cases, but in each of these cases the dog had been exposed before being given treatment.—Ernest W. Cavaness, Personal communication, May 10, 1928.

Inoculation Against Diphtheria—The winter's epidemic of diphtheria in Paris has clearly shown the value of Ramon's anatoxin. This is obtained by heating diphtheria toxin and adding to it 40 per cent commercial formalin in the

proportion of 1 in 2000. Treated in this way the toxin becomes atoxic, while keeping its antigenic properties. Anatoxin is obtainable in boxes of three ampules each containing 2.0 c.c. the liquid being tinted green. Either two or three injections are given, the first being 0.5 c.c. and the second 1.0 c.c. given a fortnight after the first. In 87 per cent of cases the Schick reaction becomes negative after the second, which makes a third injection unnecessary; if required it is given after an interval of a week. In case of urgency it may be desirable to produce a passive immunity with purified serum.

Zoeller and Ramon now recommend vaccination via the nasal mucous membrane for patients who object to subcutaneous inoculation. Against diphtheria they protect the patient by instilling concentrated glycerinated antitoxin into the nose every second day. Two and sometimes three courses of treatment, lasting 6 days with intervals of a week to a fortnight between them, have proved sufficient to convert a positive into a negative Schick reaction. The method has the advantage of being easy to apply and of not provoking any vaccinal reaction, but it is less precise than subcutaneous inoculation and fairly large doses of antigen are required. Local vaccination is said to be as successful in preventing dysentery, tetanus, and scarlet fever, as it is in the prophylaxis of diphtheria. Inoculation Against Diphtheria, *Lancet,* CCXIV: 1041 (May 19), 1928.

Serum Reactions—A study was made of a series of 237 patients with diphtheria and scarlet fever who received antitoxin at the Willard Parker Hospital, New York, N. Y. Of this number 171 were diphtheria cases and 66 were scarlet fever cases, and 164 gave a history of never having had any serum injections; while 45 had had a previous therapeutic dose, and 28 had been immunized with diphtheria toxin-antitoxin. Of those who had not had previous serum injections, 22 or 13.4 per cent, experienced a serum reaction. Of the 45 who had received antitoxin previous to the present illness, 8 or 17.8 per cent, had serum reactions. Of the 28 patients who gave a history of having been immunized against diphtheria, 4, or 14.3 per cent, gave serum reactions. These were all cases of scarlet fever. Previous administration of toxin-antitoxin appears to have little or no effect on subsequent serum treatment.—Sophie Spicer, The Effect of Previous Administration of Antitoxin and Toxin-Antitoxin on Serum Reaction, *J.A.M.A.*, 90: 1778 (June 2), 1928.

LABORATORY

C. C. YOUNG

MODIFIED SEDIMENT TEST FOR VISIBLE DIRT ADOPTED IN CONNECTICUT

FRIEND LEE MICKLE, M.S., FELLOW A. P. H. A.
Director of Laboratories, Connecticut Department of Health, Hartford, Conn.

DURING 1926 it was brought to the attention of the Connecticut State Department of Health that the sediment test for visible dirt in milk, as carried out in several of the approved laboratories of the state, varied considerably in the technic used, although supposedly each laboratory had been conforming with the procedures specified in the *Standard Methods of Milk Analysis* of the American Public Health Association.

A meeting was called to which all interested persons were invited. At that time the fourth edition of *Standard Methods* (1923) was in use and each laboratory was using standards prepared in the manner specified in that report, by adding dirt to milk. By request, the standard discs used in each laboratory were brought to the meeting, and it was very evident that no close uniformity could be expected with the use of standards which varied so greatly. The variations seemed to be due primarily to the use of samples of dirt of different sizes of particles, different colors, to difference in technic in preparing standards and to a variety of ways of interpreting the directions in *Standard Methods*.

It was the consensus of the meeting that photographic standards prepared by one set of workers and supplied to all the laboratories in the state making the test would be the solution of the problem. A committee was appointed to make tests and prepare photographic standards. The studies made extended throughout the year, and one meeting was held with the Referee of the Committee on Standard Methods of the American Public Health Association. Finally, on January 9, 1928, a second meeting of milk laboratory workers was called to discuss the report of the committee. The report was adopted with minor changes.

The method for the sediment test as given in the fifth edition of *Standard Methods of Milk Analysis* (1928) was adopted inasmuch as, during the time that had elapsed, the Fifth Edition had appeared recommending a photographic standard. A number of additional procedures, not in conflict with those of *Standard Methods,* were adopted to meet Connecticut conditions, however, because it was felt the method in the Fifth Edition does not provide sufficiently for the examination of bottled milk. It was found the bulk of laboratory milk examinations in Connecticut is of samples of bottled milk. A standard photograph, showing four additional gauges for use on bottled milk, has been prepared by the committee for distribution. All of these discs are graded as clean to conform with *Standard Methods,* but represent, respectively 0.25, 0.50, 0.75 and 1.00 mg. of dirt per pint. It was decided to return to the dairyman or health official the disc showing the dirt removed from each sample of milk attached to the report. Only the Wisconsin sediment tester and the discs of the type furnished by the manufacturer of that model were allowed where *Standard Methods* provides

that this or several other types of testers may be used.

The method, exactly as adopted at the meeting of milk laboratory workers, January, 1928, for use by all Connecticut approved laboratories, follows:

1. The method for the sediment test given in *Standard Methods of Milk Analysis* of the American Public Health Association and the Association of Official Agricultural Chemists, fifth edition, pages 32-34, was adopted. The following additional procedures which are not in conflict with those of *Standard Methods* were adopted to meet Connecticut conditions.

2. Pint samples only shall be regarded as standard. Where quart or any other size of sample is used, the report must state the size used. (The question of whether or not these results should be calculated to a pint basis, as recommended by the committee, was left undecided for later action with the provision that meantime each laboratory may so calculate or not as they prefer.)

3. Only the Wisconsin (Lorenz model) sediment tester shall be used.

4. Only the discs of the type furnished by the manufacturer of the Lorenz model shall be used, although they may be purchased from any source.

5. The sediment discs obtained from filtering samples of milk shall be graded against the photographs on page 33 of *Standard Methods* or against the extra prints of these photographs obtainable from the American Public Health Association, New York, N. Y. (These cost 75c each for either set A, B, or C or $2.25 for the three sets of pictures on page 33 of *Standard Methods*.)

6. *Standard Methods* directions shall be interpreted to mean that no person shall prepare standards by adding dirt to milk.

7. The photographs show five gauges (see top of column opposite).

All samples shall be reported by one of the five descriptive terms above and also scored in terms of either 1.25, 2.50, 3.75 or 5.00 which are figures representing milligrams of dirt per pint. In order to avoid confusion the two figures at the right of the decimal point should always be used whether or not the last figure is a cipher.

Description	Mg. dirt per pint
Clean	0.00
Fairly clean	1.25
Slightly dirty	2.50
Dirty	3.75
Very dirty	5.00

8. Percentage-clean figures and terms other than the above for expressing dirt in milk shall be completely abandoned.

9. No sample showing *more* than 1.25 mg. dirt per pint shall be reported within closer limits than the five gauges given above, the dairymen being given the benefit of any doubt in deciding between any two of the five gauges.

10. *Standard Methods* states where bottled milk is examined it should not show even 1.25 mg. dirt per pint. For milk reported as clean there shall be, for Connecticut use, an additional standard photograph of discs showing, respectively, 0.25, 0.50, 0.75 and 1.00 mg. dirt per pint. (Copies of this photograph may be obtained from the Bureau of Laboratories, State Department of Health, Hartford, Conn., at 50 cents apiece, mounted either on 3″ x 5″ or 4″ x 6″ filing cards, so long as the supply of both sizes lasts, providing you state a preference in ordering. Write Friend Lee Mickle, Chairman, Milk Sediment Committee.)

11. All milk samples graded as clean shall be reported in the following terms which are figures representing a milligram or fraction of a milligram of dirt per pint:

Clean	0.00
Clean	0.25
Clean	0.50
Clean	0.75
Clean	1.00

12. No clean sample shall be reported within closer limits than the five grades on the photograph, the dairyman being given the benefit of any doubt.

13. The discs shall be returned to the dairyman, health or dairy official, or milk inspector, together with the report.

BACTERIOLOGICAL METHODS OF EXAMINING ICE CREAM *

THE increasing interest in the sanitary control of ice cream stimulated the American Dairy Science Association to appoint a committee on bacteriological methods of analysis of this product. The report of this committee was published in a recent issue of the *Journal of Dairy Science*.[1]

The first part of this report includes detailed directions for the agar plate, and direct microscopic methods of analysis as applied to ice cream. Directions are given for the preparation and sterilization of glassware for bacteriological work, and for the preparation of media for ice cream analysis. Considerable space is given to a discussion of the methods of sampling the various ingredients of ice cream, as well as the frozen product, and to the method of measuring the sample for the gravimetric and volumetric determinations.

The last part of the report involves a discussion of the value and significance of bacterial analysis in the sanitary control of ice cream. The importance of various factors in controlling the sanitary quality of ice cream, such as the quality of ingredients, plant sanitation, contamination from human sources, use of chemical disinfectants and steam, etc., are discussed in detail. Directions are given for taking samples to detect faulty conditions in the plant operation.

The report of this committee should be of interest to anyone who is attempting to do laboratory control work with ice cream.

Through the agency of the journals, the committee wishes to enlist the coöperation and assistance of everyone who is doing work along the line of laboratory control of ice cream. Any new methods or modifications of old methods which may have proved satisfactory will be gladly received by the committee. It is the desire and aim of this committee to serve as a medium through which improved methods may be collected and passed on to others. It is not intended to propose an official method, but rather to make available to the industry all bacteriological methods which have been found satisfactory.

It may be of interest to know that the American Dairy Science Association, through its General Committee on Bacteriologic Methods of Analyzing Dairy Products, with Dr. R. S. Breed as chairman, is contemplating the formulation of a complete set of bacteriological methods for all the dairy products. This general committee expects to function largely through sub-committees, composed of men who have had experience with the various dairy products. A subcommittee on methods for analyzing butter is now actively at work; another on condensed and powdered milk products has recently been appointed; and the sub-committee on ice cream has recently published the report referred to.[1] The sub-committee on ice cream consists of A. C. Fay, Chairman, Kansas Experiment Station, Manhattan, Kan.; F. W. Fabian, Michigan Experiment Station, East Lansing, Mich.; and B. W. Hammer, Iowa Experiment Station, Ames, Ia.

NOTE: The methods herein suggested have not come before the Committee on Standard Methods of the American Public Health Association for approval and, therefore, do not represent the opinion of the Association.

1. Bacteriological Methods of Examining Ice Cream. *J. Dairy Sci.*, 10, 5:460-478, 1927. The pre-publication demand for this report has necessitated a charge of 25 cents for reprints. They may be procured from Dr. Robert S. Breed, N. Y. Agr. Experiment Station, Geneva, N. Y.

* Submitted by a Committee from American Dairy Science Association.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Mortality Experience of the Metropolitan Life Insurance Company for the First Quarter of 1928—The mortality records of the industrial policy holders of the Metropolitan Life Insurance Company show that the first quarter of 1928 shared with the corresponding period of 1927 the distinction of registering the lowest death rate (9.7 per 1,000) ever recorded for these 3 months among the industrial populations of the United States and Canada. Among approximately 16,000,000 white insured persons, the rate was only 8.8 but among about 2½ million colored persons, there was an increase to 15.9 per 1,000, from 15.5 last year; so that the composite figure for the two races showed no improvement.

The death rate for tuberculosis among the white policy holders was 72.0 per 100,000. This is not only a new minimum for any first quarter, but shows an improvement of 11 per cent over the previous minimum of 80.8 registered only last year. Within 2 years the tuberculosis death rate among white wage-earners has been cut by one-sixth. In half a decade it has been cut approximately one-third. It has been almost halved since 1920. Corresponding improvement has not been registered for the insured colored population, among whom there was actually a higher rate than during the early months of last year. Their rate of 229.3 for the quarter may be compared with 245.6 in 1923 and 310.1 in 1920, a drop of 26 per cent in 8 years.

The mortality record for the quarter shows gratifying declines among both white and colored for typhoid fever, scarlet fever and whooping cough. The measles mortality shows a small drop for the whites and a large increase for the colored. The diphtheria situation is by no means encouraging, although the rate for the colored is lower than in 1927. Last year it was believed that the increase was only a temporary phase in a situation that had previously shown improvement for 6 continuous years. This viewpoint must now be discarded and a still more earnest campaign conducted for the immunization of children against this disease. The increased prevalence of meningococcus meningitis was reflected in a rather marked increase in the death rate among Metropolitan industrial policy holders. The combined mortality from influenza and pneumonia was a little higher than in the early part of 1927. Pneumonia, in particular, showed a considerable increase among the whites. Two other diseases of outstanding public health interest, diarrheal complaints and puerperal conditions, show improvement. In the case of the latter, the drop is considerable—more particularly among the colored.

The cancer rate for whites and colored persons during the first quarter was 75.3 per 100,000, as compared with 75.1 last year. The death rate for the whites declined a little during last year, and but for a very pronounced rise among the colored policy holders, the composite rate would have dropped slightly. The mortality from diabetes continues to increase—very slightly among the whites, but pronouncedly among the negroes. The conclusion that little benefit has as yet come to the urban negro as the result of the discovery of insulin, is inescapable. Insured urban negroes not only show a

sharply increasing diabetes death rate, but their rate is now higher than that of the whites. Suicides, homicides and accidents all registered lower death rates for both the white and the colored policy holders with the greater improvement in each instance resting with the latter. The death rate from automobile accidents for the whites increased 9.4 per cent over that for the first quarter of 1927 and 14.8 per cent over 1926. For the negroes there was an increase of 5 per cent over 1927 and 37.3 per cent over 1926.—*Stat. Bull.* 9:1-5 (Apr.), 1928.

Current State Mortality Statistics—The U. S. Public Health Service has begun publication of tables from the monthly mortality reports of state health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the *Public Health Reports*. Statistics of deaths from other causes are limited for the most part to those causes which appear in the state reports. In the case of states which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented. These tabulations will be enlarged as the current data on mortality from additional states become available.—*Pub. Health Rep.* 43:743 (Mar. 30), 1928.

The Health Record of University Students as Related to Tonsillectomy—Twenty-eight per cent of the 978 men students and 32.5 per cent of the 578 women students of the class of 1926 at the University of Michigan had had their tonsils removed before entering college. In the class of 1929 this figure had risen to 35 per cent of the 1523 men students. Data from the records taken at entrance and during the college course fail to show any significant difference between the health of the two groups. There was slight advantage, however, to the tonsillectomized group in general health and nutrition.

Only 6 per cent of the 275 students with their tonsils removed, and 16 per cent of 703 students with tonsils, had had cervical adenopathy. The tonsillectomized students had more trouble with upper acute respiratory infections, 63 per cent of 537 tonsillectomized students suffering thus, in comparison with 45 per cent of the 986 non-tonsillectomized ones.—Warren E. Forsythe, *Pub. Health Rep.* 43:560-563 (Mar. 9), 1928.

Mortality Statistics of Prussia, 1926—In Prussia, exclusive of the Saar region, the total number of deaths in 1926 and 1925 was 445,754 and 450,973, respectively, or 115.9 and 118.5, respectively, per 10,000 population. The death rate for 1926 declined by 2.6 per 10,000 population, as compared with that of 1925. In 1925, the reduction in the total number of deaths, as against 1924, 3.3 per 10,000 population, whereas, from 1923 to 1924, a reduction of 13.7 per 10,000 population, had been recorded. Almost one-fourth (22.9 per cent) of the deaths recorded in 1926 (102,269, or 26.6 per 10,000 population) resulted from transmissible diseases. The rate per 10,000 population for the remaining causes of death was as follows (the rates for 1925 being in parenthesis): diseases of the circulatory organs, 17.1 (17.1); senile weakness, 12.1 (12.1); cancer and other neoplasms, 11.2 (10.8); cerebral hemorrhage and other diseases of the nervous system,

9.6 (9.8); diseases of digestive organs, 9.0 (9.3); congenital lack of vitality and developmental defects, 6.8 (7.3); diseases of the respiratory organs, 4.5 (4.4); accidents or other violent forces, 3.8 (4.0); diseases of the urinary or genital organs, 3.0 (2.9); suicide, 2.5 (2.4); deaths in childbed, exclusive of childbed fever, 0.5 (0.5); murder and homicide, 0.2 (0.2).—*J. A. M. A.* 90:995 (Mar. 24), 1928.

Public Health in Palestine and Trans-Jordania, 1926 — The report made by H. M. Government to the Council of the League of Nations on the administration of Palestine and Trans-Jordania for the year 1926 has been issued from the Colonial Office. In regard to Palestine it is stated that the general health of the community was satisfactory, apart from the heavy incidence of enteric fever and dysentery in certain populous settlements, where conditions of sanitation and housing were bad. The estimated population at July 1, 1926, was 761,896 (excluding Bedouin). Births during the year numbered 40,721, or 53.45 per 1,000 population; and deaths 18,623, or 24.44 per 1,000. Infant mortality was 6,644 or 163.15 per 1,000 births. There were 1,400 cases of enteric fever, with 110 deaths, and 1,732 of dysentery, with 37 deaths. There has been no serious outbreak of any other infectious disease, and no case of cholera or smallpox. An intensive campaign of revaccination against smallpox was carried out in the spring, when 170,881 vaccinations were performed. The last years have seen a remarkable growth of infant welfare work in Palestine.

The number of immigrants during the year was 13,910 (6,276 men, 4,864 women, and 2,770 children), of whom 13,081 were Jews. The figures present a striking contrast to those for the year 1925, when 34,641 immigrants entered the country, of whom 33,801 were of Jewish race. The total number of emigrants during the year was 9,429, of whom 7,735 had settled in the country only since 1920. Three-quarters of the emigrants were working men and women. The volume of unemployment increased constantly throughout the year from 3,000 at the end of 1925 to 8,000 at the end of 1926.—*Lancet* 2:1425 (Dec. 31), 1927.

The Value of Prenatal Care—There were 3217 mothers delivered in the obstetrical department of the Louisville City Hospital from April 1, 1923, to July 1, 1927. Of these 1,156 had received no prenatal care at the hospital clinic. The remaining 2,061 were registered in the clinic and had made at least 1 visit. Among the 2,061 patients receiving prenatal care there were 6 maternal deaths, a mortality rate of 2.9 mothers per 1,000 deliveries. The maternal deaths among 1,156 non-clinic patients numbered 26, giving a death rate of 22.4 per 1,000 deliveries. In 1927 there were no maternal deaths among the 658 prenatal clinic patients.

Fetal and neonatal deaths calculated on the basis of the total number of deliveries show a mortality of 7.5 per cent among the clinic patients and 22.6 per cent among the non-clinic. There were 35 cases of eclampsia among the non-clinic mothers; 10 of these patients died giving a mortality of 8.5 deaths per 1,000 deliveries. Eclampsia developed in 12 of the clinic patients, due to inadequate prenatal care, but none of them died.—Alice N. Pickett. *Kentucky State M. J.*, Feb., 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Restaurant Inspection—The Bureau of Food and Drugs of the New Jersey State Department of Health has been carrying on an active campaign toward inspection of eating places within the state. Items covered by their inspections include facilities for handling and preserving all foods, methods of serving ice water, lighting and ventilation facilities, general cleanliness of the kitchen, disposal of garbage, protection against flies and roaches, cleansing of dishes and utensils and sanitation facilities provided for employes. While it is appreciated that the technic of making a really valuable inspection of food handling establishments is not simple, the inspectors of the state department are endeavoring to coöperate with local health officials in inaugurating a restaurant inspection program. A. G. Wigley and A. I. Goehrig. *Am. City*, 38:155 (Feb.), 1928. Abstr. W. L. Havens.

Avoiding Pollution by Coke Oven Wastes—Phenol or carbolic acid is a product of destructive distillation of coal, and is present to the extent of less than 0.5 per cent in the ammonia liquor which condenses out of raw coke-oven gas. In the process of lime treatment of this ammonia liquor, the phenol combines to form calcium phenolate which passes into the sewers as still waste. Subsequent action of acids and carbon-dioxide in the water reduces the calcium phenolate to phenol which in the event of subsequent chlorine sterilization of the water produces the pronounced and disagreeable chlorophenol taste.

Investigations in late years have attempted to remove the phenols prior to the lime treatment. Two successful methods were evolved; namely, the benzol extraction method and the patented Tiddy-Hoffner or distillation method. Description of the first method is given, together with sketch of process and accompanying formula and reactions. Through operation of this benzol extraction method, the extraction efficiency has been raised over 96 per cent. More than 25,000 gallons of pure phenol are recovered yearly from the 36,000 gallons of ammonia liquor treated daily. The plant is financially self-supporting. Hugh E. Jones. *Water Works Eng.*, 81:141 (Feb. 1), 1928. Abstr. Chester Cohen.

Odor Nuisances at Sewage Works: the Use of Chlorine—Emanating from sewers and sewage plants are several different odors. Hydrogen sulphide has been shown to be the most serious of the odor-producing gases and is also destructive to masonry structures.

In odor control, prevention rather than destruction is a chief objective. The introduction of chlorine at a point where sewage is fresh is important, though frequently the sewage becomes stale before a major portion of it can be collected for treatment.

Where odor production exists, the following conditions seemingly must occur simultaneously: (1) presence of sulphates; (2) hydrogen sulphide-producing bacteria; (3) temperature sufficiently high to promote rapid growth of sulphide-splitting organisms, and (4) period of time necessary for producing hydrogen sulphide. Elimination of but one of these factors will result in securing effective control of hydrogen-sulphide generation.

Odor destruction consists primarily in splitting up the hydrogen sulphide in sewage.

Another factor in odor control is the effect of the course of the sewage, whereby an intimate mixture may be caused between fresh sewage and liquid heavily laden with hydrogen sulphide. Saving in chlorine consumption may be effected by changes in flow chambers to prevent disturbance of the lower 5 feet of liquid in the chamber. Chlorine application to the influent will effect complete odor elimination at moderate expense. On the whole, odor control is much more readily effected at separate sludge digestion plants.

In conclusion, examples are given of chlorination for odor control at Neodesha and Independence, Kan. L. H. Enslow. *Surv.*, 73:183 (Feb. 3), 1928. Abstr. H. W. Streeter.

A Comparison of the Temperature and Bacterial Count of Milk and Foam During Certain Stages of Pasteurization—This article includes a complete description of the apparatus and methods employed, including the construction, placement and operation of the thermocouples. Studies were made under conditions of normal operation at plants using the batch method of pasteurization.

Bacterial count of foam was higher in every instance than that of the milk. During pasteurization the bacterial count of milk decreased, while in 66.7 per cent of the tests the count in the foam increased. Bacterial count of foam varied greatly at different points in vats. Depth of foam did not affect bacterial reduction. If vats are tightly closed, bacterial content of foam is reduced.

The temperature of the air above the foam, and of the foam itself was in every instance lower than that of the milk. The amount of foam varied in area from small patches to the entire surface of the vat and in depth from ½ to 4 inches. In no case was the foam raised to a satisfactory pasteurizing temperature. H. W. Whittaker and R. W. Archibald. U. S. Dept. of Agriculture *Tech. Bulletin No. 18*, Sept. 1927, 11 pp. Abstr. C. T. Butterfield.

Controle Technique d'une Installation Municipale de Sterilisation d'eau par l'ozone. (Control of a Municipal Plant for Purification of Water by Ozone)—A description of the water disinfecting plant of the City of Boulogne consisting of an ozonizer and the circulating system for ozonized air and the sterilizer or disinfecting unit. The ozonizer consists of a series of glass cylinders, a coazial aluminum rod which serves as one electrode and the aluminum enclosing case serving as the other electrode. A single phase, 50 cycle, alternating current transformed to 8,000-10,000 volts is applied to the electrodes. Air dried by calcium chloride is forced through the cylinders in which the silent electrical discharge occurs generating the ozone. This ozonized air is forced through a sterilizer, consisting of a vertical tower of reinforced concrete divided at intervals by horizontal partitions of perforated celluloid to insure intimate contact between the water and the ozonized air, both of which enter at the base of the tower. The effluent from the sterilizer is tested periodically with starch iodide for free ozone and in the manner used for determining the residual chlorine in water. Bacteriological data are given indicating that the number of *B. coli* per liter was reduced from 1,000 to 0 and the gelatine count was reduced from 714 to 6 per c.c. The plant, with a capacity of 10,000 gal. per hr., consumes 0.65 K.W. hrs. of current to operate the ozonizer, consisting of two units of 3 cylinders each, and an additional 1.1 K.W. hr. to operate the air compressor.

J. Salmon and P. Quarre. *Bull. Hyg.* 2:978 (Dec.), 1927. Abstr. C. R. Cox.

Colorado State Board of Health, Division of Sanitary Engineering, Laws and Regulations—This is a 34-page leaflet issued in 1927. In it appear either compilations or the text of state laws of Colorado and of the rules of the State Board of Health relating to public water supplies, water purification plants, sewer systems, sewage treatment plants, municipal garbage collection and disposal, rural and camp sanitation, swimming pools and other public bathing places, irrigation with sewage, etc., being of usual concern to the sanitary engineering divisions. The leaflet is unusually embracive, giving for example the high lights of the district improvement acts for financing sewers and water systems and the laws relating to eminent domain. Issued by Colo. State Board of Health, Denver, Colo. Abstr. C. G. Gillespie.

Cyanide Waste Poured Into Stream Poisons Livestock—Cattle died soon after drinking water from a small stream into which was discharged the effluent from an Imhoff tank, intermittent sand filter disposal plant. Investigation disclosed that on this particular day a 600 gal. vat of electrolyte, which among other salts contained 2 lbs. of sodium cyanide per gal., had been dumped into the sewer by mistake. The question arises as to what effect small amounts of this substance will have upon the bacterial flora of sewage disposal systems. A. H. Wieters. *Water Works Eng.*, 81:204 (Feb. 15), 1928. Abstr. H. E. Miller.

Spent Gas Liquor in Relation to Sewage Disposal—Spent gas liquor is dangerous to fish life and cattle and detrimental to small streams, as its oxygen absorbing qualities prevent and retard self-purification. The difficulties of dealing with gas liquor have become more acute because of: (a) the increased manufacture of gas for domestic uses; (b) the introduction of vertical retorts with use of steam, thereby increasing the volume of gas liquors, and (c) the adoption of the activated sludge method of sewage disposal. With vertical retorts, 76 gallons of spent liquor are produced per ton of coal, whereas with horizontal retorts, 50 gallons are produced. The efficiency of the activated sludge process is likely to be affected by the presence of unduly high amounts of spent gas liquor in the sewage treated. Because of its high oxygen-absorption power, the admixture of the spent liquor with crude sewage requires greater aerobic activity in the treatment of such mixtures, usually necessitating an increased purifying area.

It is possible, by several measures named, to diminish the amount of gas liquor produced; likewise to purify the liquor before its discharge into sewers. In the latter connection, it is noted that if the volume of spent gas liquor does not exceed 1 per cent of the volume of domestic sewage, and is introduced into the sewers in a small steady flow, the mixture can be purified without difficulty. Experiments made on treatment of the spent liquor have indicated that when diluted until the 4-hour oxygen absorption value is 4000 p.p.m., the liquor itself is amenable to biological filtration, which at a rate of 15 gals. per cu.yd. per day of 8 hrs., reduced the oxygen absorbed by 90 per cent, and a second filtration at a rate of 12 gals. per cu.yd. produced an effluent absorbing less than 20 p.p.m. of dissolved oxygen.

In conclusion, it is stated that the discharge of spent gas liquors into sewers should be as far as possible uniform and proportionate to the flow of domestic sewage. The construction of equalizing tanks for this purpose offers no engineering difficulties. H. Ross Hooper. *Surv.*, 73:111 (Jan. 27), 1928. Abstr. H. W. Streeter.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH. D.

Practical Application of Two Qualitative Tests for HCN in Ship Fumigation—This investigation was undertaken with the purpose of establishing a simple chemical test for the determination of HCN in practical ship fumigation. The importance of such a test in determining the time at which a vessel may be entered by the fumigating or the vessel crew is obvious.

The following criteria were laid down as being necessary for the test:

1. The test should be definite under all conditions, at or above the predetermined danger point to human life.
2. It should be such as can be applied without attendant danger to those making it.
3. The time factor of its reaction should be slow enough to permit of accurate computation with an ordinary watch in the hands of the usual personnel engaged in this work.
4. The test should be efficient within at least 10 per cent of error as to time.
5. The varying atmospheric conditions at seaports should not materially affect the application of the test.

Both tests herein described depend on the change in color of filter paper which has been previously immersed in certain solutions. The first test consisted in the use of benzidine copper acetate. This test is valid only where no disturbing constitutents may enter the reaction; for example, such cases as chlorine and nitric acid. Study, however, revealed the fact that the reaction time was so rapid that an error of but three seconds might mean an error of 30 per cent or more in the efficiency of the test.

The second method which was studied was the methyl orange-mercuric chloride mixture. This is a color test depending on the change of color of a No. 40 Whatman filter paper, treated with this solution, to which has been added a specific amount of glycerine. On exposure to HCN gas this paper, which is an orange color, turns pink.

In conducting these tests, amounts of HCN, varying from 6.7 to 0.21 gm., were used per 1000 cu. ft. of air, and the study indicated that there is an approximate ratio between the concentration of HCN, the time of exposure, and the color of the test paper. A series of 55 comparative tests were made on 10 vessels using these test papers and white rats, in order to estimate the degree of toxicity of the atmosphere. It was found that these test papers are very satisfactory for the purpose intended.

One difficulty, however, arose, namely the maintenance and use of the test papers under certain conditions of humidity. When attention was paid to the keeping of the papers at a relative humidity of 70 to 75 per cent they were found to yield results of good practical value.

Chloro-picrin, which is an ingredient of certain ship disinfectants, was found not to affect this test paper on six minute's exposure.—G. C. Sherrard, *Pub. Health Rep.*, 43, 17:1016-1022 (Apr. 27), 1928. L. G.

Some Clinical and Pathologic Observations On Silicosis in Ontario—During the course of dust studies, conducted by the Division of Industrial Hygiene of the Ontario Department of Health, 1487 men were examined clinically and by means of the X-ray. Nineteen pairs of lungs obtained at postmortem were studied and the percent-

age of silica, estimated at SiO_2, in the ash of these lungs was determined. The silica content of the lungs was determined by digesting and igniting the lung tissue, and finally a hydrofluoric analysis of the residue. Most of the men examined were exposed to dust containing silica, a few exceptions being added as controls. The dust varied from 2 per cent to 99 per cent in silica content, estimated as SiO_2. A discussion is presented showing the relation between the condition of the worker prior to death and the pathological findings of his lungs on autopsy. The lowest amount of silica found in this survey to be involved in the production of silicosis was from 10 per cent to 14 per cent.—Andrew R. Riddell, and H. E. Rothwell, *J. Indust. Hyg.*, 10, 5:147-157 (May), 1928. L. G.

Fatal Accidents From Electric Shock in Recent Years—From this brief committee report one may conclude that the fatality rate from electric shock in the United States (0.9 per 100,000) is somewhat higher than that for Switzerland (0.7 per 100,000), and both of these countries have rates greatly in excess of that for England and Wales (less than 0.1 per 100,000).

An interesting table is presented which shows the number of fatal accidents from low voltage circuits (110 to 550 volts). It would appear from this that low voltage circuits are definitely responsible for approximately 75 deaths for the period 1912 to 1926. The conclusion is evident that these low voltage circuits must be reckoned with in accident prevention work of this type.

The committee recommends that education of the public in precautionary measures and the importance of using only first class household equipment be urged, and that continued education of the employes of electrical industries, as well as the development of methods of resuscitation for cases of cardiac failure, be undertaken.—*J. Indust. Hyg.*, 10, 4:111-116 (Apr.), 1928. L. G.

The Problem of Automobile Exhaust Gas in Streets and Repair Shops of Large Cities—The atmosphere of 14 cities in the United States was sampled by taking "grab" samples in 500 c.c. glass bulbs. The samples were representative of the atmosphere at the breathing level of the usual pedestrian, in general some 20 or 30 feet from the street intersection, and at the time of peak automobile traffic. Other samples were taken in repair shops, and a third group in automobile busses.

The samples were analyzed for carbon monoxide by the iodine pentoxide method, using liquid air for the removal of the unburned gasoline and other interfering substances. The method probably has an accuracy of 1/10 part of carbon monoxide in 10,000 parts of air.

In all, 141 street samples were taken, yielding an average of 0.8 part of carbon monoxide per 10,000 and a range of from 0.2 to 2.9 parts per 10,000. One hundred and two samples were taken in automobile repair shops. They yielded an average of 2.1 parts per 10,000 and a range of 0.2 and 11.0 parts per 10,000. But 7 samples were taken in automobile busses. These averaged 0.5 parts and a range of from 0.1 to 1.0 parts per 10,000.

The authors conclude that no hazard exists in the automobile busses tested and that to the ordinary pedestrian no carbon monoxide hazard exists in the city streets; the police traffic officers are the only exception to this rule, and the potential hazard to these officers may be minimized by diminishing the duration of exposure. In striking contrast with these results, however, are those of the garage repair shops. The authors consider that a dangerous condition demanding serious consideration exists in these establishments. Certain precautions concerning the operation of cars in

repair shops are discussed.—J. J. Bloomfield, and H. S. Isbell, *Pub. Health Rep.* 43, 13:750-765 (Mar. 30), 1928. L. G.

Effects of Dust Upon Coal Trimmers—In the statistical portions of this paper the authors present an analysis of 426 deaths between the years 1910 and 1926, obtained from the Coal Trimmers' Union. When compared with deaths among the male population of England and Wales for the same years this material indicates that coal trimmers have a somewhat lower rate from phthisis and a distinctly higher rate from bronchitis and pneumonia than have the male population of England and Wales. Statistical evidence, calculated as percentage of deaths from certain causes of the total deaths for the years 1910-1912 for England and Wales, is also discussed, and this evidence appears to indicate that coal heavers have approximately the standard rate from phthisis, cancer and circulatory diseases, a higher rate from bronchitis, and a much higher rate from pneumonia. Comparative mortality figures for phthisis, bronchitis and pneumonia for the years 1921-1923 and for all occupied and retired males, all coal miners, and for coal boat loaders and dischargers is presented. These figures serve to corroborate the statistics previously discussed in indicating that coal miners suffered a somewhat lower phthisis rate and that coal miners and coal boat loaders suffered a greatly increased bronchitis and pneumonia rate.

Radiographs and case histories are presented of some of the coal operatives which indicate that the chests of these men are not normal, yet the authors feel that these must not be confused with the silicotic fibrosis of silica workers.

The statistics of the Coal Trimmers' Union included 51 cases of cancer. Eleven, or 22 per cent, were cases of cancer of the skin, in contrast to but 3.3 per cent of cases of cutaneous cancer among males in England and Wales for the year 1925. The 5 cases of cancer of the skin of the neck are considered noteworthy by the authors. On the other hand, cancers of the intestines, etc., amounted to but 6 per cent, as contrasted with 23 per cent for England and Wales.—Edgar L. Collis, and J. C. Gilchrist, *J. Indust. Hyg.*, 10, 4:101-110 (Apr.), 1928. L. G.

Arsine Intoxication: A Case of Suspected Poisoning in the Steel Industry—The "pickling" of metal in acid baths for the removal of "mill scale" may lead to the production of arseniureted hydrogen (AsH_3) or arsine. The present report deals with the industrial and clinical history of a worker engaged in "pickling" sheets of rolled metal in a 5 per cent sulphuric acid bath. The worker was employed for approximately 9 months in handling these sheets of metal. A short time after he had changed his employment he complained of a feeling of tightness across the chest, difficulty in breathing, and a generalized feeling of weakness. His skin presented a scaly, peculiar bronzed appearance which grew progressively worse until he developed tremors and paresthesias of the muscles of the arms and legs, and finally complete paralysis of these members. The report presents an interesting inquiry into the various factors surrounding his work and the materials with which he was engaged, in an effort to decide whether or not the industrial environment might constitute the source of his poisoning. A 473 liter sample of air taken at a representative position in the workroom was found to contain less than 1/1000 mg. of arsine. The conclusion is reached that the man's industrial occupation was not responsible for his poisoning.—C. W. Muehlberger, A. S. Loevenhart, and T. S. O'Malley, *J. Indust. Hyg.*, 10, 5:137-146 (May), 1928.

FOODS, DRUGS AND NUTRITION

WALTER S. FRISBIE

Gassy Fermentations in Reheated or Processed Cheese Products Containing Pimentos—Manufacturers of cream cheese, loaf cheese and cheese spreads experience considerable difficulty from gassy fermentations when pimentos are incorporated in these products. Reheated or processed cheese products are particularly favorable media for the growth of bacteria. By observing certain precautions in manufacture it is possible to protect reheated or processed cheese products from contamination with gas producing bacteria from every source except the cheese itself. Contamination from this source might also be controlled and the gassy fermentation prevented if it were economically possible to use only the best quality of cheese. Inasmuch as a certain amount of cheese of poor quality is always used, the possible presence of gas producing bacteria must be accepted. Sterilization of the manufactured products is obviously impossible. By removing the fermentable carbohydrate from the pimentos an attempt was made to render the products less favorable as media for the development of the gas producing bacteria. Experiments were conducted wherein pimentos were washed in double their weight of tap water three times in 30 minutes. They were then allowed to stand in fresh water for 18 hours, rinsed in fresh water, ground and sterilized. When pimentos thus washed and sterilized were added to plain cheese spread, no gas developed. The experiments were repeated a number of times with confirmatory results. The washing which is believed to be excessive and which can probably be lessened removes some flavor and color from the pimentos. The method has not been tried on a factory scale. The findings are applicable to all food products in which pimentos are incorporated which are subject to a gassy fermentation.—W. R. Albus and S. H. Ayers, *J. Dairy Sci.*, 11:175 (May), 1928.

Seasonal Variations in the Antirachitic Value of Sunlight—This article is a review of an address delivered at Kansas City before the Interstate Post-Graduate Medical Association by Dr. Alan Brown and Dr. F. F. Tisdall. At Toronto rats fed on a rachitogenic diet were placed out of doors from 11 a. m. to 1 p. m. daily, control animals on the same diet being kept in the dark during the experimental period. Each week throughout the year batches of rats were started under these conditions and after a month each batch was killed and examined for signs of rickets. The results showed that in Toronto even winter sunshine had slight antirachitic value, but from the end of February onward, this value increased sharply, corresponding with an increase in the shorter rays of the solar spectrum. The biological test bears very little relationship to meteorological records of sunshine during the corresponding periods, owing to the ease with which the effective rays are absorbed. A second series of experiments designed to test the relative values of direct sunshine and of "skyshine" demonstrated that the scattered rays were from one-half to two-thirds as effective as the direct sunshine, a point of practical importance as indicating a means of applying an efficient dose of

ultra-violet rays in cases where radiant heat is undesirable. Animals exposed to light were not only protected from rickets but also showed an increased resistance to deliberate infection. The intestinal contents of the irradiated rats were found to be more acid than those of the controls, indicating a better digestion in the former.—Anon., *Lancet*, 214:715 (Apr. 7), 1928.

Pellagra-like Lesions Associated With Deficiency of Vitamin B_2 in the Rat—The experiments here recorded confirm those of Goldberger and his colleagues as to the presence of two vitamins in yeast. The presence of both factors is necessary for the normal growth of the rat. In the absence of the thermo-labile vitamin B_1 there is a failure of growth, loss of appetite and a terminal fall of body temperature with the histological appearances characteristic of starvation. There may or may not be symptoms of polyneuritis followed by death in from 4 to 6 weeks. The condition resulting from the deficiency of vitamin B_1 is very similar to that arising from vitamin B deficiency.

In vitamin B_2 deficiency there are characteristics symmetrically arranged skin lesions, together with ulceration of the tongue and buccal mucosa. The changes are very similar to those of pellagra in man. A papillomatous condition of the cardiac portion of the stomach is common in rats deprived of vitamin B_2 and in animals dying as the result of this deficiency there are found the histological changes associated with inanition. —G. M. Findlay, *J. Path. & Bact.*, 31: 353 (Apr.), 1928.

An Unusual Case of Food Poisoning—This case of food poisoning, which was found to be due to *B. aertrycke* probably transmitted in pork pie, presented certain unusual features. The poisoning spent itself on the upper intestinal tract causing vomiting and pain but no diarrhea or signs of enteritis. There were some indications of paratyphoid fever and nocturnal rise of temperature, which is unusual in food poisoning cases. A serological investigation revealed the presence of 1:25 agglutinability to *B. aertrycke* (Mutton) and complete absence of agglutinins to *B. typhosus, B. paratyphosus A, B* or *C*, to *B. enteritidis* (Gaertner), *B. aertrycke* (Newport) and to the dysentery group. From the feces of the patient, an organism was isolated which gave cultural reactions of the Salmonella group and displayed marked flocculation in a dilution of 1:25 with *B. aertrycke* serum (Mutton type). Four days before the onset of the illness the patient had partaken of some pork pie and three other members of the household who had also partaken had suffered from slight malaise, nausea and vomiting from 1 to 3 days after this meal.—F. M. Rowland, F. W. Marshall and J. Menton, *Brit. M. J.*, 3506:439 (Mar.), 1928.

A New Differential Medium for the Paratyphoid Group—The authors devised a new culture medium for differentiating members of the paratyphoid group. This medium has the following composition.

Agar	0.20 gm.
Distilled water	1000 c.c.
Alcoholic solution of phenol red (0.2%)	12 c.c.
Difco peptone	10 gm.
Sodium potassium tartrate (Rochelle salts)	10 gm.

The medium used should be adjusted to a pH of 7.6-7.8 and is best used in tubes, unslanted, a stab inoculation being made. Observations should be made at 24 and 48 hour intervals, although the reaction in tubes is generally stable, for at least 7 days. The paratyphoid strains that impart an acid reaction to the medium give a distinct yellow color in the lower portion of the

tube, with a surface zone of from 4 to 7 mm. which remains red, while those strains that produce an alkaline reaction give a diffuse homogeneous reddish coloration. *B. aertrycke, B. enteritidis, B. suipestifer* and *B. abortivo-equinus* gave acid reaction in this medium while alkaline reaction was produced by *B. schottmüleri* and *B paratyphosus A*. Attempts to devise a plating method with this medium were only partially successful. In the experience of the authors this medium has given a perfectly definite differentiation with a large number of strains (87 *B. aertrycke*, 45 *B. schollmülleri*) previously identified by the agglutinin absorption method.—E. O. Jordan and P. H. Harmon, *J. Infect. Dis.*, 42:238 (Mar.), 1928.

The Vitamins of Commercially Concentrated Orange Juice—In a previous investigation it was shown that 5 c.c. and 10 c.c. of fresh ripe California orange juice were doses adequate in vitamin A and vitamin B respectively for the requirements of the albino rat. Using the same breed of animals and an identical technic, a product prepared from the juice of the same species of orange by concentration *in vacuo* was found to meet the nutritive needs of the animals as regards vitamin A and vitamin B at the same level in each case. The two investigations were run in close succession and the conditions of experiment were maintained as far as possible identical. It can be concluded that the content of vitamin A and vitamin B of fresh ripe California orange juice survives the industrial process of concentration by the method of vacuum distillation at 37°C. without apparent loss, at least in the case when the resulting concentrate is of fairly recent manufacture. From a review of the literature the author states that vitamin C also is preserved without loss when orange juice is concentrated at a low temperature *in vacuo*.—S. G. Willimott, *Biochem. J.*, 2, 22:535, 1928.

Iodine Content of Some Water Supplies in Goitrous Regions—The following determinations of iodine in drinking water of goitrous regions are uniformly low, except in the case of Lasalle, Ill. Lasalle has two water supplies. It is stated that there is less goiter among those persons drinking water from these drift wells than the other source of supply, not analyzed.

Source		Iodine (parts per billion)
Litchfield, Ill.	Impounding Reservoir	0.17
Chicago, Ill.	Lake Michigan	0.13
Peru, Ill.	Rock Wells (1300 ft)	0.31
Peoria, Ill.	Drift Wells	0.15
Lasalle, Ill.	Drift Wells	18.00
E. St. Louis, Ill.	Mississippi River	0.29
Champaign-Urbana, Ill.	Drift Wells	1.01
Murphysboro, Ill.	Big Muddy River	0.30
Springfield, Ill.	Direct from wells	0.50
Springfield, Ill.	Filtration Galleries	0.52
Duluth, Minn.	Spring	0.014
Grantsville, Utah	.....	1.33

—Gertrude H. Beckwith, *Proc. Soc. Exper. Biol. & Med.*, 25:117 (Nov.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Emotional Factors in Nutrition Work With Children—Both the metabolic stability and the action of the gastrointestinal system are closely allied to and seriously affected by the emotional state of the individual.

In a group of malnourished children studied at the Institute for Juvenile Research, the condition in some cases could be traced to the presence of organic or functional disease, in others to food inadequate in kind. A third group remained in which neither of the aforementioned causes could be found but rather, a definite emotional disturbance which was interfering with the nutrition. Causes of such neurotic tendencies may be traced to very early influences. The period of nursing even is a formative one and should therefore be so controlled that the child acquires not only the proper attitude toward feeding but also the proper habit training. With a lack of such discipline, which indeed requires forethought and understanding on the part of the parents, a child with definite neurotic manifestations will be the result, a problem much more difficult to cope with as the child grows older and which may, eventually, for treatment lead to the necessity of a temporary separation of the child and the parents. In a nursery school or in a hospital where the child has the opportunity to eat with and imitate others of his age there is less tendency for him to demand his own way. He will act with the group.

The method of preventing and overcoming the type of problem discussed, that is, the child malnourished because of emotional disturbances due to environmental conditions, is by means of preventive pediatrics and mental hygiene. —Emotional Factors in Nutrition Work With Children, George J. Mohr, M.D., *Mental Hyg.*, XII: 2 (Apr.), 1928.

Mental Hygiene Even for the Feebleminded—"On this whole problem of feeblemindedness we are tarrying too long on the bridge of mental levels with its I. Q. buttresses. It is time that we crossed over to the other side into the less definite but far more interesting and practical realm of this problem," thinks Dr. George L. Wallace, widely known in this country for his work with the feebleminded and for his administrative success with the School for Feebleminded at Wrentham, Mass. He feels that in our worry about the I. Q. and mental levels we often fail to see the feebleminded problem as it really is; in other words, that we overlook the fact that we are dealing with a condition and not a theory. The problem with the moron is lack of social adjustment. This is proved by the fact that we daily see many morons in a community without recognizing them because they have managed to adjust themselves adequately. Intellectually lacking, they react normally to their environment. On the other hand, those who do not react normally react quite similarly to those who, as Wallace says, make trouble on the higher mental levels such as pathological liars, thieves, neurasthenics, etc.

This being the case, the ideas expressed in the article in question indicate that there should be something more done than diagnosing mental retardation and creating special classes for the education of children at low mental levels. It is equally important that there be application of the principles of mental hygiene in connection with special class work so that many children other-

wise liabilities may be adjusted to their environment in childhood and so avoid becoming social failures in adult life. This program, of course, would go hand in hand with one for increasing facilities for the institutional care of the feebleminded in need of it.—George L. Wallace, M.D., *Mental Hyg. Bull.*, Apr., 1928.

Practicing What They Preach—Very practical inducements are offered by the Vassar Brothers Hospital in Poughkeepsie, N. Y., to prospective mothers to get adequate prenatal care. This hospital has set aside the entire third floor for maternity work and offers to prospective mothers of the community a flat rate of $65 for all semi-private patients whose prenatal care has been adequate. This charge includes all laboratory examinations made at the hospital, use of the delivery room, and board and care of the mother and baby, regardless of the length of stay in the hospital. The only requirement is a record of prenatal care. A further statement is made that for ward patients a flat rate of $35 is offered on a basis similar to the above, with the possibility that those unable to meet this charge can have a still further adjustment.

Poughkeepsie is evidently spurred on to this highly constructive step by the fact that their maternal death rate is 63 per cent higher than that for the entire state and their infant mortality rate is 46 per cent higher. They are relying upon the prenatal care to produce a change in this situation and feel encouraged in that belief by the work accomplished by four public health nurses in Tioga County which apparently was responsible, in part at least, for a reduction in the mortality amongst mothers and children cared for.

A further commendable step has been taken by the hospital in sending to each of the 125 members of its staff a copy of *Standards of Prenatal Care* (supplied by the New York State Department of Health) and record forms for patients.—*Health News*, Apr. 16, 1928.

The Infrequency of Severe Rickets In New Orleans And Vicinity—One of the interesting facts concerning rickets is its variation in occurrence throughout the different sections of the country. Forbes and Green found the incidence of the disease to be 25 per cent in Denver in 1925; Morse found it to be 80 per cent in Boston in 1900. From New Orleans, where the average is 45 per cent among children 3 years old or less, Dr. Williams reports a study of 100 children where an effort was made to determine if possible reasons for the comparatively low percentage in that vicinity and any other conditions pertinent to the knowledge of rickets as a disease.

Over a period of a year, it was found that there was a seasonal variation in the content of inorganic phosphorus in the blood of the group as a whole; that most of the calcium readings were normal while the inorganic phosphorus was low in every case of diagnosed rickets. There was a direct correlation between the inorganic phosphorus content of the blood and the possible sunshine for each month. Among the breast-fed infants, there was a lower incidence of rickets with a definite relationship to the health of the mother and to the nutrition and the care given herself and the baby. Of the breast-fed infants who developed rickets, of which there were 3, 2 were being nursed by mothers who did not eat green vegetables. Among the 100 children studied, 26 per cent had rickets.

The conclusion formed is that because of its geographical location New Orleans is able to report not only a low percentage of rickets but also a mild form of the disease.—The Infrequency of Severe Rickets in New Orleans and Vicinity, C. T. Williams, M.D., *Am. J. Dis. Child.*, 3514, Apr., 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Field Training for Health Services—The East Harlem Nursing and Health Service, through the generosity of the Milbank Memorial Fund, now offers educational experience and field training to qualified nurses and other workers in the health field.

A full-time supervisor of student activities will direct the field work of the students in coöperation with the general supervisors of the nursing staff and the special supervisors of nutrition work, health education, psychiatric social work, research and statistics.

An advisory committee on the educational program, appointed by and responsible to the Governing Board of the East Harlem Nursing and Health Service, has been named. The membership of the committee, which includes representatives from the fields of education nursing, medicine, nutrition, social work and statistics, gives assurance of the broad scope of the teaching program and promise of interesting developments in the correlation of allied services in the health field.

Application for field training or observation will be considered in the light of the candidate's past experience and future plans.

Teachers College is actively interested in the teaching program, and will participate through the Departments of Nursing Education and Nutrition.—East Harlem Nursing and Health Service, 354 East 116th Street, New York, N. Y.

The Nursing Shortage—The preliminary work of the Committee on the Grading of Nursing Schools has brought to light some interesting facts regarding the alleged nursing shortage. In fact, it found the shortage to be non-existent. On the contrary, the evidence points to an over supply of nurses as far as gross numbers are concerned.

Whereas there were but 15 nursing schools in the United States in 1880, there were 2,155 in 1926, which added, and are adding yearly, 18,000 graduates to the nursing profession. Many of these drop out of professional life early, but at least half remain for eight or more years.

Old schools are growing, new schools are springing up, sickness is going from the home to the hospital, cases are shorter, people in the United States are in better physical condition than ever before. Yet, at the same time, there are many calls which go unanswered. In the face of these facts, what is in the future for the nurse?

Three solutions to the situation have been proffered. The first is that the nursing schools should exclude any applicant who does not give reasonable promise of becoming an ethical and competent nurse. The second is that the nursing profession, especially that part concerned with private duty nursing, endeavor to keep track of what its members are doing and to try to put each into the place for which she is best adapted. The third suggestion is that an effort be made to work out a more flexible nursing service with different degrees and qualities of nursing care at different costs for different periods of time. Such a service would need to acknowledge that all nurses are not of the same value and that cases vary in importance and difficulty. Assignments, hours, and pay should be adjusted to meet these facts.

A reorganization in private duty nursing along these lines, to be at all successful, needs the sympathetic and intelligent support of the medical profession.—May Ayres Burgess, Ph.D., The Nursing Shortage, *J. A. M. A.*, 90, 12: 899 (Mar. 24), 1928.

The Truth About Insulin—Dr. Hobart Rogers answers simply and graphically some of the questions which we hear repeatedly with regard to insulin.

1. Is Insulin a Cure? Insulin is not a cure in the sense that it will restore diabetics to perfect health, but its use can restore many diabetics to such a degree of health that they may dispense with its use.

Diabetes is a disease of assimilation in which sugars are not properly utilized but are allowed to accumulate in the blood and pass out, unused, in the urine. Insulin is a substance produced by the pancreas gland which is necessary for the proper assimilation of sugars. All of us have insulin all the time, produced within ourselves. A defective or diseased pancreas, which cannot produce insulin, causes diabetes. The treatment consists of giving the patient insulin extracted from the pancreas glands of cattle.

In many diabetics, the pancreas is not really destroyed but merely exhausted from overwork, and, if relieved of overstrain for a time, it may recover to such an extent that insulin treatment will be no longer necessary.

2. If One Begins its Use Must He Not Always Continue? "Any diabetic who is taking insulin may discontinue its use and return to the old methods any time he chooses." Some diabetics continue to need it while others prefer to take it because of the salutary effect it has upon them. Under insulin treatment, sufficient food may be eaten to enable diabetics to maintain their normal weight and do hard work; while without insulin so little food is allowed that they are thin, starved and melancholy, never able to do a day's work.

Diabetics who do not take insulin are always made very ill by colds, tonsillitis and pneumonia. The two most dreaded complications are diabetic coma and gangrene which often follow intercurrent diseases and sometimes end fatally. A diabetic properly treated with insulin is in no more danger of acute diseases than a normally healthy person.

3. Is not the Use of Insulin a Great Inconvenience? The treatment and the hypodermic injection once or twice a day are both inconveniences, but, if they are accepted as part of the day's routine, they can be made as commonplace as dressing, bathing or shaving.

4. Is There not Something Just as Good That Can Be Taken By Mouth? There is nothing as good as insulin. It is a purely physiological product with an absolutely harmless action. The preparation called synthalin can be taken by mouth, but its effects are feeble and it can be used only in the mildest cases. Furthermore, it is a drug.

CONCLUSION

Insulin is not a cure but a perfect means of control, capable of producing great improvement.

The benefits derived from its use greatly outweigh the inconvenience of administration.

No more conveniently administered substitute has yet been found.—Hobart Rogers, M.D. The Truth About Insulin, *Pacific Coast J. Nurs.*, XXIV, 4:204 (Apr.), 1928.

Nursing Situation Surveyed in Queens—How adequate is the supply of public health nurses in Queens? Under what auspices do they work and what is the scope of the work done by each?

The answers to these questions will be found in the report of the nursing situation in the Borough of Queens which was recently undertaken by the Welfare Council of New York City. The Committee, appointed by the Public Health Nursing Section of the council, has submitted its report to the Executive Committee of the council and prompt action is to be taken upon the recommendations.

Frederika Farley, chairman of the committee, states in the report that there is need of three times as many public health nurses as are now available in the borough. Ten times as many nurses are needed in the particular fields of infant welfare and tuberculosis. To provide for an adequate maternity service, Queens requires fifteen times as many nurses as it now has.

The scarcity of public health nurses would present a critical situation in the event of an epidemic, for in a borough of one million people there are only 131 nurses. Of these only 71 are available for the community at large. The report further states:

The critical nature of the situation is illustrated by the following facts, revealed in our survey: with 2363 known cases of tuberculosis in the borough, and 3544 "contacts" or other persons living with those having tuberculosis, as well as for all other communicable diseases, there are only 24 where at least 60 are needed; in the field of infant's health 6 nurses are on duty and 60 are needed; in the maternity field, in this borough which had 12,925 births last year, 2 public health nurses are available where 30 are needed; in the schools of Queens with 149,000 pupils, 27 nurses are on duty and 68 are needed; in the field of bedside care 47 nurses are available and 182 are needed.

The committee found that no instruction in "Home Hygiene and Care of the Sick" is being given in Queens except by 4 nurses of the Department of Education in 4 high schools.

RECOMMENDATIONS MADE

The report of the Public Health Nursing Survey Committee makes the following recommendations:

The Committee suggests that inasmuch as all the nursing organizations in Queens, except 3, are working on a borough basis, that the nursing work be organized as a borough activity rather than a community activity.

That the Red Cross Chapters promote classes in "Home Hygiene and Care of the Sick."

That, if possible, the public health nursing work in Queens Borough be developed as a generalized program rather than a specialized program, but if this is not feasible to begin with:

That the first additional nurses be assigned to duty in the bedside group putting special emphasis on the necessity of increasing the complete maternity service;

That additional nurses be added to the other groups as rapidly as possible, and that, as soon as practicable, there be one nurse director for the public health nursing work in the Borough;

That this report be submitted to the Welfare Council by the Public Health Nurses Section with the recommendation that the Welfare Council present the report to the public-spirited people of Queens Borough;

That the Welfare Council appoint a committee of interested people of the borough to promote plans whereby this increased nursing service may be developed as soon as possible.

Long Skirts at an Annual Meeting—In the 30th annual meeting of the Victorian Order of Nurses for Canada, Montreal Local Association, there was featured a

. . . five-minute scene depicting the nursing visit 30 years ago, and one depicting the nursing visit today, which struck a new note in annual meetings for Montreal. The voluminous skirts of the gay 90's, the lack of social organization with a consequent lack of coöperation, the old-fashioned cradle continually rocking, were in striking contrast to our short-skirted brisk nurse of today, with all sorts of social organizations ready to help her, no cradle but a crib for baby, and occupational therapy for grandma who used to sit huddled in a chair all day with folded hands gradually becoming stiffened. The scenes were short, and the dialogue very much to the point, with enough humor to embellish it.—

Genevieve L. Hurd, Executive Secretary.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

New York Studies Its Health Education Material—The readers of this department will be interested in knowing that a study of the variety and extent of the use of various materials and methods in health education by a selected group of agencies is under way in New York City. Later we hope to be free to announce the publication of a report on this study which is being made by Janet Jarrett representing the Research Bureau of the Welfare Council of which Neva R. Deardorff is director.

Give Them a Chance—Give the actual publicity workers in your organization a chance to get ideas and inspiration from attendance at the Annual Meeting in Chicago next October. No one is so skillful and resourceful in the spreading of health information that he will not gain greatly from attendance at the Chicago meeting. Nothing can take the place of personal contacts and conferences with workers in the same field. Better to cut down the expenditure for printed matter or other publicity and education budget items than to have your actual publicity worker stay at home.

"No—But—"—Here is what Prof. Harry A. Overstreet said at a recent luncheon of the New York Committee on Publicity Methods about a cancer folder: "'Have You a Cancer?' it asks in large black type all over the first page. I don't like the idea—'No!' I retort mentally, and toss the folder into the waste basket. But my wife picks it up and looks inside. 'But this is interesting!' she commented, 'I didn't know cancer had symptoms, and—see, there is a cancer age!' Now the outside of that folder was not interesting. It got the 'No!' response, which is fatal to appeal literature. But the inside was positively exciting. If the writer had raised a different kind of question on his front page, if he had asked, 'Do You Know the Symptoms of Cancer?' he would have drawn from me the 'No—but . . . .' response which would have carried me over into the substance of the appeal. Don't forget that the 'No' response is fatal to interest, the 'No—but . . . .' response is stimulating to interest. But no interest will survive a long and labored introduction. Get on with it—don't spend so much time getting ready."—*Better Times*, 151 Fifth Ave., New York N. Y. Jan. 2, 1928.

Interest! Instruction!! Action!!!—The three-fold job of the health educator or propagandist:

(a) The interest of those to be instructed must be borne in mind; their attention must be arrested, desire must be created, and self-regard must be stimulated. A commercial advertiser studies the psychology of the crowd and seeks to touch the elemental instincts of the individual. His aim is to amuse, or to give pleasure, or to instill fear into the mind of his client. He visualizes for him something which he has not hitherto seen, or calls out into exercise such imaginative faculty as he possesses. We can all think of advertisements which stick in the memory because the advertiser, understanding our psychology, has impressed upon us something which we cannot forget, even if we would.

(b) Having thus aroused interest, the propagandist must fix or anchor it by instruction, by providing a body of knowledge, concrete, correct and timely, attractively presented in very varied form, appealing to both eye and ear.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

(c) Finally, also like the good advertiser, he must get action. The advertiser wants people to buy his wares: the propagandist wants to obtain from his clients assent to his advice, a practice and a mode of life.—

Public Education in Health. "A Memorandum addressed to the Minister of Health." 1926. British Library of Information, 44 Whitehall St., New York,

EDUCATIONAL MATERIAL

The revised series of pamphlets and other publications of the American Heart Association, in course of preparation, have been classified as follows: (a) those for the workers, including physicians, nurses, secretaries and others; (b) those for the patients and their families; and (c) those for the general public.

Health—Diseases, Drugs and Sanitation. List of publications relating to these subjects. Revised. Superintendent of Documents, Washington. Price List 51. *Free.* New editions mailed as issued —if requested.

Safeguarding Your Health from Tuberculosis. Department of Health, New Haven, Conn. Well done 24-page pamphlet explaining to citizens "How New Haven Cares for Tuberculosis" through public and private agencies. A form of reporting the work being done.

The 50 million dollar welfare bond issue to be voted on in Pennsylvania in November is responsible for four 6-page folders issued by the Pennsylvania Mental Hygiene Committee of the Public Charities Association, 311 South Juniper St., Philadelphia, Pa. The copy is good, and the form is a good example of the better grade of quite inexpensive folder for widespread use. Of course the type should be larger, but the leading makes it quite readable. Each of the series is on a different color of paper. The titles are: Salvaging the Feebleminded, Handicaps of Epilepsy, Why So Many Go Insane, Do You Know? Samples *free.*

A handy manual of 16 pages, Health for the Family, tells the residents of Bellevue-Yorkville district, New York City, of the clinics and services available. Page by page a type of clinic or service is described, with days and hours. Very well done—except that the map might better have been an inch wider to gain in clearness and usability. Address Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y. *Free.*

An educational campaign against rickets conducted by Mulberry Health Center, 256 Mott Street, New York, N. Y., produced a series of exceptionally good 1-page leaflets, an 8-page pamphlet, and four posters (one of which is not so good). A sample set for $1.50; set of leaflets, 10 cents; posters, 40 cents each. Special rates for quantities. Ask for Plans for a Campaign Against Rickets. See reproductions in *Trained Nurse.* January, 1928. A brief account of the campaign in *Public Health Nurse,* March, 1928.

Groceries as Nutrition Educators —Going out after the coöperation of a particular group is well illustrated in the grocery store window project of the Syracuse Department of Health and Syracuse Health Demonstration. In an elaboration of the following paragraph at a meeting of the Committee on Publicity Methods at Memphis, Miss Bache brought out how by enlisting a few stores an object lesson was provided to use in getting more of them to coöperate. At one stage of the effort in Syracuse the canvass of stores was developed by districts where the cumulative effect was good both upon the storekeepers and the public.

Syracuse has been using for the past year its grocery store windows to give out nutrition lessons. Each week ten grocery stores had a new display in which health and nutrition played the leading rôle. To make the exhibits attractive, painted beaver board figures were used illustrating the subject under discussion. At the same time the exhibit was displayed in

the window, the grocers gave out printed sheets bearing the nutrition lesson outlined by the Department of Health. Some of the subjects chosen for window displays and nutrition lessons were The Child's School Lunch, Food for the Working Man, What Should Go in the Housekeeper's Market Basket? Dairy Products which make for Health, and Vegetables on the Family Dining Table. The large grocers who did some advertising saw the advantage of the exhibits at once, but the small corner grocery storekeepers had to be won. It was with them that perhaps our greatest victory lay, for many of them became sold to educational advertising and much helpful information was gotten over not only to the consumer, but the merchant.—

Louise Franklin Bache.

SCHOOLS AND CHILDREN

How it came about that in Athens, Ga., the children "who needed to have teeth filled, pulled or cleaned, actually had them filled or pulled or cleaned," is told in A Plan with Teeth in It, by Slaughter and Smith. *Hygeia*. Dec., 1927. A reprint *free* from Child Health Demonstration Committee, 370 Seventh Ave., New York, N. Y.

Health in Drama, Verse and Song. Tuberculosis Society of Detroit, 51 Warren Avenue West, Detroit, Mich. For teachers. Out of print but will be reprinted if enough orders are received at 25 cents a copy.

Jack O'Health and Peg O'Joy by Herben (primary grades), and Most Wonderful House in the World by Haviland (middle grades) are recommended in Books for the Rural Schools in the Southern mountains, by *Mountain Life and Work*, Berea, Ky.

The Jolly Jester, by Harvey W. Wiley. *Good Housekeeping*. Jan., 1928. "Here is a clown spreading the gospel of good health most convincingly."

May Day suggestions for the whole community are given in A Festival Book of May Day—Child Health Day. 1928. 80 pages. Illustrated. American Child Health Association, 370 Seventh Ave., New York, N. Y. 10 cents. The May Day plans may be adapted to "Play Day" at a later date in communities where May Day was not observed.

Long Life to Your Children's Teeth (18 pages); The School Lunch (32 pages). Educational Department, Postum Company, Battle Creek, Mich. *Free*.

TITLES

False Dentists and False Teeth—*Hygeia*.

The Old "Spring Tonic" That Stood on the Shelf—Oregon State Board of Health.

Don't Buy Spectacles and Tinware Together—*Northwestern Health Journal*. April, 1928.

Slenderizing—New York State Department of Health. News release and radio talk.

The Sneeze Versus the Job.—Woman's Bureau, Washington. Press release 621. Paragraph on "common colds."

The lost 16,000—*Child Health Bulletin*. March, 1928. "The loss each year of about 16,000 mothers in childbirth."

Thousands of Hunters Trail Deadly Tuberculosis Germ—*Northwestern Health Journal*. April, 1928.

Are You Digging Your Grave with Your Fork?—Title of a pellagra folder by Health Conservation Department. Pilot Life Insurance Company, Greensboro, N. C.

This Is No April Fool!—A folder on smallpox distributed by the local gas and electric company. Prepared by Racine Board of Health.

The Road to Happy Motherhood—Milwaukee Health Department. 40 pages. Excellent "mother book." Not simple enough for some groups.

Slender Youth—a Pilot Life Insurance Company (Greensboro, N. C.) folder. Some of the sub-titles: Youthful Lightweights Are Bad Risks, Fashion-Plate Girls May Be Walking Sanitarium Ads, A Big Breakfast Starts the Day Right.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Triumph Deferred—Eight measures which had been adopted by Congress and presumably represented the will of the people were vetoed by President Coolidge about the middle of May, 1928. One of these was the Parker Bill for federal health coördination; another was a bill allowing retirement privileges under certain conditions to emergency officers of the World War, including many medical officers.

Congress showed its regard for the Presidential disapprovals by promptly repassing by overwhelming majorities three of the vetoed measures, including the emergency officers' bill. Unfortunately, no action was taken again on the Parker Bill before adjournment of the session.

The reasons given by the President for his strange action in vetoing the Parker Bill were that it tended to "militarize" the U. S. Public Health Service and that one part of it was unconstitutional. To support this latter contention he quoted from an opinion of the Attorney General to the effect that the bill limits the choice of presidential appointees to persons who pass an examination conducted by a board convened by the Surgeon General and also limits the choice to persons who are recommended by the board and the Surgeon General. The Attorney General seems to think that such action vests in the Surgeon General improper participation in the executive functions of the government.

With regard to the U. S. Public Health Service as a military organization, the U. S. Court of Claims held on April 30, 1928, in the case of Rupert Blue v. U. S. that it is not a military body. In that case former Surgeon General Blue was denied exemption in his income tax claimed for the years 1918 to 1920 on the ground that the U. S. Public Health Service was part of the military forces. The Parker Bill does not cause any further militarization of the U. S. Public Health Service, but simply provides that sanitary engineers and certain other scientists be given a commissioned status similar to that of the medical officers. This provision has always been ardently opposed by H. M. Lord, Director of the Bureau of the Budget, one of the President's close advisers.

The article of the Constitution which the Attorney General seems to think is contravened by the Parker Bill states (Section 2), ". . . the Congress may by Law vest the Appointment of such inferior officers, as they think proper, in the President alone, in the Courts of Law, or in the Heads of Departments." It is pretty far fetched to say that the Parker Bill is invalid under this clause, inasmuch as the system approved by law in 1889 (25 Stat. L. 639) and never held invalid is merely extended to cover additional personnel.

In concluding his message on this matter the President stated, "The other provisions of the bill have my entire approval, and if the unconstitutional feature should be removed and the militarization feature should be removed I should be pleased to approve it." What needs to be removed is the baneful influence of the Director of the Budget. He and Senator Smoot seem to be having the last laugh, but triumph for public health is only postponed, not prevented.

Congress Adjourns—The First Session of the Seventieth Congress adjourned on May 29, 1928, after making a better record from the standpoint of public health legislation than has been the case for some years.

In addition to passing the Parker Bill, Congress adopted a public resolution designating May Day as Child Health Day. In passing the new revenue measure, Congress voted not to increase the tax from $1 to $3 on physicians who dispense narcotics, in spite of vicious attacks made on the medical profession by Senator Smoot. Provision for deduction on the income tax report of traveling expenses for attending professional meetings was adopted by the Senate in considering this bill, but did not survive in conference.

Progress was made on a number of other public health measures. Thus, the Ransdell bill (now S. 4518) for a national institute of health was reported in the Senate. Copies of the hearings on this measure are now available and may be obtained from the Senate Committee on Commerce. A bill for the investigation of cancer (S. 3554) passed the Senate on May 18, as did also a bill (S. 3936) to regulate the practice of the healing art in the District of Columbia, on May 29. A similar bill (H. R. 12947) has been reported in the House.

The bill to establish two federal narcotic farms (H. R. 13645) passed the House on May 21, while the measure to amend the definition of oleomargarine (H. R. 10958) was reported on May 11. A bill (H. R. 11981) relative to service of officers of the Medical Corps passed both branches of Congress, in spite of the customary comments by Senator Smoot. A bill to regulate the sending of poisons through the mails (S. 3127) also passed the Senate, on May 10.

In connection with medical matters, there is a new veterans' hospitalization law, carrying an appropriation of $15,000,000. Another new law extends medical and hospital relief to retired officers and enlisted men of the Coast Guard. Congress voted the pay and allowances of a colonel to the major who now serves as the President's physician.

New Bills in Congress—Among the nearly 20,000 bills introduced so far in the 70th Congress are a number of other new ones of interest to sanitarians. These include: H.R. 13902 for examinations for the criminally insane; S.4463 for a children's tuberculosis sanatorium in the District of Columbia; H. J. Res. 309 calling upon the President to issue a proclamation every year designating the first week in May as national health week; H.R. 13854 to provide facilities for emergency medical care at the Capitol; and S.4478, to prohibit use of public funds for purchase of butter substitutes for government wards.

All of these measures and a few others pertaining to public health, as previously reported in this department, will be before the second session of the 70th Congress when it convenes next December.

Erudition in the Appendices—The body and appendices of the May numbers of that preceptive magazine, the *Congressional Record*, have some of the aspects of a textbook on public health, for they contain the following didactic articles: Poison in Denatured Alcohol and Modern Views Concerning the Use of Alcohol, by Representative William I. Sirovitch, May 16 (page 9267); Cancer-Humanity's Most Deadly Scourge, by Senator Neely, May 18 (page 9393); Prevention and Cure of Tuberculosis, by Dr. J. Morrison, May 23; Noguchi, by Representative Sirovitch, May 24 (page 10005); Filibuster and Health, by Senator R. S. Copeland, May 26 (page 10412); Federal

Maternity and Infancy Act, by the League of Women Voters, May 29 (page 1070).

Federal **Narcotic Act Sustained**—The constitutionality of the Harrison Anti-Narcotic Act of 1914, as amended in 1918, was sustained by the U. S. Supreme Court in the decision of Nigro v. U.S., handed down on April 9, 1928. The case had gone to the Supreme Court by certificate of the Circuit Court of Appeals of the Eighth Circuit, with a request for answers to four questions. The Supreme Court answered only the first and second, which dealt with the meaning and scope of the word "person" in the first sentence of section 2 of the law, and with the general constitutionality of the act.

The second section of the Harrison law makes it unlawful for any person to sell, barter, exchange, or give away narcotics except in pursuance of a written order on a form issued by the Commissioner of Internal Revenue. In this case Nigro unlawfully sold morphine without such written order. The question was whether the words "any person" in the section were limited to those persons who are required to register and pay the tax. The answer of the Supreme Court was "No."

The law was upheld as a valid taxing measure, designed primarily for the purpose of raising revenue. The Court points out that merely calling a law a tax measure does not necessarily make it so, and cites the Child Labor Tax Act, which was held to be unconstitutional. The tax under the antinarcotic act amounts to about a million dollars a year, which is a substantial sum and a real source of revenue to the federal government.

England **Has Its Troubles**—American health officials are not the only ones who are sometimes unable to secure reports of tuberculosis on time. According to a note in the *Lancet* for May 19, 1928, complaint has been made by the Medical Health Officer of Carlisle that physicians delay in notifying of cases of tuberculosis. There was considerable debate by the health committee as to whether to prosecute or not and it was finally decided to send another warning.

Miscellaneous items—The national narcotic drug situation today is outlined by L. G. Nutt, U. S. Deputy Commissioner of Narcotic Prohibition, in *Pennsylvania's Health* for May-June, 1928.

The White Slave Traffic Act can be violated by transportation in a privately owned automobile, according to Holden v. U. S. 23 Fed. R. (2d), 678.

More than a million animals were given the tuberculin test in the United States during March, 1928, according to the U. S. Bureau of Animal Industry. The number of reactors was 27,999. The number of cattle in accredited herds is over 2,000,000, and 20,500,000 more are under supervision.

The question has been asked as to what supervision is exercised by states over professional blood donors. If any reader can answer this, enlightenment would be appreciated by the Associate Editor.

"The Law Says"—All persons are presumed to know the law, but the written law is so extensive these days that it eludes even the lawyers, though they have the advantage of knowing where to look for it. In the *Commonhealth* of the Massachusetts Department of Health for Jan.-Feb.-March, 1928, Merrill E. Champion, M.D., contributes a short article about the laws in that state which apply to public health. This is useful information for local health officials as well as for laymen, and the type of thing which could appear to advantage in many state health bulletins.

BOOKS AND REPORTS

Health and Wealth—*A Survey of the Economics of World Health—By Louis I. Dublin, Ph.D. Statistician, The Metropolitan Life Insurance Company, New York, N. Y. New York: Harper,* 1928. 361 pp. Price, $3.00.

This book is a collection of essays which have been given by the author during the past few years. Although they consider a number of different subjects, they cover phases of public health which are necessary for clear understanding of public welfare and the practical application of our knowledge. They treat largely of vital statistics, a subject on which too many health officers and physicians are deficient, and show how such knowledge can be applied in carrying out better programs. The lesson that life and health are our greatest possessions is stressed, and while it is recognized that a value cannot be put upon life solely in terms of dollars and cents, it is clearly shown that the rearing and education of a child costs money, and that the early death of an educated citizen is a financial loss to the community. Such facts are useful to all who are concerned in public health work, and especially to those who must deal with legislative bodies, to whom the economic side of health must be demonstrated.

Any country with a low standard of health is a menace to its neighbors, especially in these days of rapid transit, and international health service is one of the foremost factors in creating an understanding between nations and cementing friendship. "For none of us liveth to himself, and no man dieth to himself."

A strong plea is made for more liberal expenditures in health work. As far as children go, the loss from illness is more than the amount which good care would cost, and from death the loss is more than ten times as great.

It is difficult to say which of these essays is most important. We must call attention to the one on heart disease, since at present it is far in the lead of all other diseases as a cause of death, while tuberculosis, which was called only a short time ago "Captain of the Men of Death" has dropped into the fifth place.

Another particularly interesting and timely essay is on "Birth Control and the Population Question." The author shows that our annual increase is only about half of what has been generally claimed and holds that all forecasts must be revised in view of our declining fecundity. We are very near the danger line of a stationary population. In view of this, the widespread propaganda for birth control is out of place, especially since it is universally practiced among those who are best fitted to become the parents of future generations. A dig is taken at the "Nordic Myth," the author holding that when the upper and lower 10 per cent of our population are eliminated, there is little indication of marked differences in ability among the intermediate 80 per cent who form the bulk of our plain folk carrying on the work of the world.

In close relation to this topic is the changed status of women, which is considered a "major revolution in the history of the world." In 1920, more than 8½ million women were gainfully employed, less than 2 million of whom were married. Of a million professional women less than 125,000 were married, and experience has shown that the greater number of them will remain single.

We wish space permitted a longer review of this unusually helpful book.

The author has the faculty of making figures interesting even to those who lack talent in this respect. He holds a position which brings him into constant contact with the problems which he discusses. For life insurance companies a correct knowledge of such subjects is essential to success. We know of no one who has taken better advantage of his opportunities than the author. He has given us a book with which every health officer, health worker, and statesman should be familiar, and which will interest all who are concerned in the welfare of humanity and the future of the race.

The make-up of the book is beyond criticism, the paper is light, yellow tinted, with a mat surface, and the print clear. M. P. RAVENEL

Why Men Fail. *Edited by Morris Fishbein, M.D. and William A. White, M.D. New York: Century Co.*, 1928. 344 pp. Price, $2.00.

Why Men Fail is a book of 344 pages containing 13 chapters on such subjects, as Parents of Failures, The First Job, Sex Has Thrown a Bomb Into Business, Wives Who Help Their Husbands to Fail, "Queer" Failures, Day-Dreamers and Bluffers, Beating Handicaps, Handicap-or Alibi, Fear, Why Women Fail, Job Misfits, and Home-Made Failures.

The title of the book is accurate, but from the sales viewpoint unfortunate. The surreptitious buyer will not want his friends to suspect him of a personal reason for needing it. Many outwardly successful men are inwardly conscious of failure.

As the complexities of life increase so do the chances for failure, because our individual mental machinery cannot carry the additional load required for success. "Of all the beds in all the hospitals throughout the United States," says Dr. William A. White in the introduction, "one in every two is for mental disease; in other words, there are as many beds for mental ailments as for all other ailments put together." This does not include the large number with minor mental defects who somehow manage, though inefficiently, to carry on.

This book is the result of a conference in Cincinnati, O., on why men fail. It was attended by the leading psychiatrists of the country. Many of us are unaware of misfunctioning relationships, or, if aware, where to begin tightening up the machinery. Also, most of us have rather confused ideas about what a psychiatrist is and does. In a word, he is an unraveler of hidden causes who then helps to reconstruct maladjusted persons. The reading of this book establishes increased confidence in the existence of practicable solutions to problems of failure.

In speaking about melancholia one of the authors, Dr. Karl A. Menninger says: " . . . . Few realize that murder is of much less frequent occurence than suicide. Moreover, the victims of suicide are, generally speaking, far more desirable members of society than the victims of murder."

One does get the impression that most of the roads on which society's misfits travel, if pursued sufficiently far, lead to the psychiatrist's door. But what if they do? It's no disgrace to be mentally sick. And without an understanding guide, this road might have a more unhappy ending. W. W. PETER

Physiology—*By V. H. Mottram, Professor of Physiology in the University of London. New York: W. W. Norton & Co.*, 1928. 279 pp. Price, $3.00.

Many years of teaching physiology convinced the author that the average student was overwhelmed by the size of textbooks, and their apparent lack of beaten tracks brought discouragement. He determined on a plan which would give the beginning student a bird's-eye

view of the boundaries and important features as a preliminary to future study. After making a sketch plan of the foundational material, he was induced to add the most recent views of physiologists in simple and untechnical language. The present book, therefore, has been designed as an introduction to the study of physiology, not only for medical students, but for all others requiring a general knowledge of the subject. Indeed, the book is so written that any well educated person can understand it.

The author takes as a sort of text the question "How Does the Human Body Work?" The first chapter gives a survey of the field of physiology, and ends with the statement: "The result of countless years of evolution is an organization which works on common sense principles." Successive chapters are devoted to the various parts of the body and explain their functions. It seems to us that the nervous system is very properly considered first, on the ground that the " . . . nerves bear the brunt of modern civilization and a healthy nervous system is more important in daily life almost than any other part of the body."

In closing the author modestly says that he has given only the slightest sketch of the realm of physiology, and advises the study of more complete books. While we have no desire to dispute what he says, we must express the opinion that anyone who reads this work understandingly will have a very clear idea of the subject, and only those who are intending to specialize in teaching or research, need go any further.

The book is well printed on light paper with a mat surface. It is well illustrated in black and white. Within the field selected, we know of no book which can be more safely recommended. The author has evidently read widely, and relieves the tedium of difficult study by many interesting references, in addition to which he has a terse way of impressing facts upon the reader.

M. P. RAVENEL

The Mental Health of the Child—*By Douglas A. Thom, M.D. Cambridge: Harvard University Press,* 1928. 46 pp. Price, $1.00.

In this little book, Dr. Thom has discussed in very simple terms some of the important factors to be considered in developing and preserving the mental health of the child. In these pages he discusses the modern attitude toward mental health, showing the very important part that the early life of the child plays in the later adjustment of the human being. The relation of adults, particularly parents, to the problems which come up in the life of the child are particularly stressed, and two case stories are given to illustrate their relation to the development of some such common problems as temper tantrums, masturbation, and so forth. Throughout this little book, emphasis is continually laid on the fact that behavior is the resultant of many relationships and situations affecting the life of the child, and that the understanding of his behavior means the understanding of motives and of these basic things. He particularly stresses the point that a child must gradually develop his own independence and free himself from the dependency situation which is normal in infancy and which is gradually lessened in the normal course of growth and development.

FREDERICK H. ALLEN

Clinical and Abnormal Psychology—*By J. E. Wallace Wallin, Ph.D. Boston: Houghton Mifflin,* 1927. xvii,+ 649 pp. Price, $3.00.

The study of the individual, his original endowment, his problems, relation to environment, reactions and ability to adapt are assuming an ever-increasing importance. As a result the clinical psychologist is now with us; his avowed

function is the scientific study of these factors. To correlate and delimit the field and to make the subject accessible to students, educators, social workers and others interested in abnormal behaviour problems, are the objects of this book.

There is a short introduction to the subject and definition of what the author means by clinical psychology. He then proceeds systematically and didactically, in the pro and con method, to deal with its various aspects.

The second part of the book deals with the general level of intelligence, and specific intellectual abilities and disabilities. There is a concise historical and critical survey of the development of the various psychometric procedures, with special reference to the Binet-Simon group. The psychology of the special senses, with illustrative cases, is clearly discussed. Memory, attention, associational processes, normal and pathological, are fully treated from the theoretical and experimental viewpoints.

The author gives a brief outline of some of the psychoses and succeeds in familiarizing the reader with symptomatology. Psychoanalysis receives the usual summary and almost complete rejection, by this author, on at least seven counts.

Neuropsychiatrists, if they read this book, might perhaps disagree with several phases of it. The elusive difference, according to the author, between the clinical psychologist and the psychiatrist, gives to the latter quite different proportions. One does not feel inclined to believe that Dr. Wallin's outline of requirements are quite sufficient to enable one to make clinical diagnoses, even though he does advise "a minimum amount of medical work including physical diagnosis [*sic*], pediatrics, nose, throat, eye and ear disorders, orthopedics, mental deficiency from the physical standpoint and neurology (particularly the nervous and mental disorders of childhood)." Truly a large order even—"if the student begins to specialize in his senior year at college . ." Fundamentally the idea embodied in this "mushroom specialist" concept is absurd. One does not acquire medical training by the "course" method. A clinical diagnosis involving the special knowledge of the possible physical factors involved should only be made by a qualified physician.

One or two, perhaps minor details, are noteworthy and illuminating: The footnote on page 316, " . . . upon development of the frontal lobes of the cortex (the layers of gray matter covering the *cerebrum and cerebellum*)" [Italics reviewer's]; the sentence on page 443, "When there is an excessive secretion of sugar (*glycosuria*) the excess supply passes into the urine and blood . . ."

Where the author deals with his own subject and within his special field he is clear, concise, critical and worth reading. The bibliography is valuable.

M. RALPH KAUFMAN

Laboratory Manual for the Detection of Poisons and Powerful Drugs—*By Dr. Wilhelm Autenrieth, authorized translation by William H. Warren, Ph.D., Philadelphia: Blakiston,* 1928. 698 pp. Price, $6.00.

This is the 6th American edition translated from the 5th German edition, which has been completely revised and provided with extensive additions. Dr. Autenrieth's book is so complete that it almost defies adequate reviewing.

The volume treats of those substances which distill at boiling temperatures from acid aqueous solutions, and considers these in the first group. Those members which are non-volatile under these conditions, such as salicylic acid, caffeine, etc., are considered in the second group. All those metallic poisons constitute a third group. The fourth

group concerns itself with the materials not considered in any one of the three previous groupings. A chapter is devoted to apparatus and special methods of examination, and the closing chapter is devoted to quantitative estimation of certain alkaloids and other principles in crude materials. This edition has a supplement devoted to the preparation of reagents and the detection of blood stains and human blood. And lastly, an appendix in which the narcosis theory of Meyer and Overton is discussed, along with certain other special subjects relating to alkaloids.

A colorimetric method for the estimation of minute quantities of hydrogen sulphide in water and air is described.

This volume should continue to hold its high place in the laboratory devoted to the detection of poisons and drugs in the animal body.

LEONARD GREENBURG

Handbook for the Medical Soldier—*By Major A. D. Tuttle, Medical Corps, U. S. Army, New York: William Wood,* 1927, 691 pp. Price, $5.00.

The need in the new and changed post-war Army for a comprehensive manual for the Medical Departments of the Regular Army, the National Guard, and the Organized Reserves has now been filled. This handbook has been carefully prepared and abounds in information for the medical soldier and for others interested in medical and sanitary problems of the Army. It contains a foreword by Surgeon General Ireland. Basic technical subjects, such as first aid, elementary anatomy and physiology, materia media and pharmacy, nursing, hygiene and sanitation, mess management, foods, minor surgery, clerical work, and the care and operation of motor vehicles are given in some detail. An enormous amount of valuable material has been assembled in a relatively small space. The book is clearly written, contains 24 chapters, 180 illustrations, and has a flexible binding.

While it is designed primarily for the enlisted man, this manual should prove invaluable for medical officers and nurses, as well as for others interested in national preparedness.

IRA V. HISCOCK

Max von Pettenkofer. His Theory of the Etiology of Cholera, Typhoid Fever and Other Intestinal Diseases—*A Review of His Arguments and Evidence—By Edgar Erskine Hume, M.D., Dr. P.H., LL.D., Major, Medical Corps, U. S. A. New York: Hoeber,* 1927. 142 pp. Price, $1.50.

Major Hume has performed a real service in making available for the first time a biography of Pettenkofer, the German scientist who was one of the first great epidemiologists. This little book is more than a biography, however, for only about one-third is devoted to the events of Pettenkofer's life. The remainder of the text considers in an interesting manner the work of Pettenkofer on cholera and typhoid, and his deductions and theories concerning the nature of the spread of these and other intestinal diseases. A bibliography of 227 publications by this early sanitarian, together with 57 references to articles about Pettenkofer, completes the book. There is no index.

The modern sanitarian, for all his progress, can derive much of benefit from the example of his predecessors. As Hume points out, Pettenkofer was often wrong, according to present knowledge, but he was a versatile scientist who made great contributions to chemistry, physiology, and public health. The life of any man who could clean up a city as Pettenkofer did Munich, and reduce its typhoid death rate to a comparatively negligible quantity, is worth knowing about. The sanitarian can, therefore, read Major Hume's book with profit.

JAMES A. TOBEY

The Essen Number—*Report of the convention of the Association for Water, Earth and Air Hygiene held in Essen in June, 1927. Published by and obtainable through the Landesanstalt für Wasser-Boden-und Lufthygiene, Berlin-Dahlem, Eherenbergstr.* 38-42. 1927. 518 pp., 288 ill. Price, 12 R. M.

This volume contains the proceedings of the twenty-fifth annual convention of the Association for Water, Earth and Air Hygiene held in Essen in June, 1927 (first convention outside the city of Berlin). The location of Essen in the Ruhr Valley in the heart of a thickly populated industrial section offered exceptional attractions for such a convention.

At the same time as the convention there was an exposition ("Achema") of chemical apparatus held in Essen under the auspices of the Division for Water Chemistry of the Association of German Chemists (Vereins Deutscher Chemicker). Part 9, pages 439-494, of the volume is given over to a description, profusely illustrated, of the apparatus exhibited at this exposition.

The papers covered the entire field of sanitary science from the engineering phases of water supply and waste treatment, the effects of air pollution on human population and vegetation, to the disinfection of clothing and the control of vermin. The following is a list of the papers presented at this convention:

Water and Sewage in the Rhine-Westfall Industrial Area, especially, with Reference to the Emscher- and Lippe Association, by H. Helbig

Sewage Treatment Works of the Emsch Association, by M. Prüss.

The Disposal of Settled Sludge from a Chemical Standpoint, by H. Bach

The Work of Ruhrverband, by Dr. K. Imhoff.

River Clarification and Power Installation at Hengstey, by O. Spetzler

Biological and Chemical Sewage Purification with the Aid of Air, by Dr. F. Sierp

The Left Lower Rhine Drainage Board in Moers Niederrhein, by K. Fehring

The Ruhr Valley Reservoirs, the Möhne and Sorpe Reservoirs, by E. Link

The Water Supply of the Ruhr Coal District from the Hygienic Standpoint, by H. Bruns

The Water Supply of the City of Essen, by B. Nerreter

Permutit Water Purification with a Special Reference to the Circulatory Regeneration System of Hufschmidt, by K. Hofer

Air Hygiene, by E. Wernicke

Vegetation and Poisonous Gas, especially Sulfur Dioxide, by E. Tiegs

Chemical Questions of Air Hygiene, by W. Liesegang

Air and Dust Investigation of the Rhine-Westfall Industrial Area, by H. Reisener

Air Pollution and Prevention, by L. Diesfeld

Question of Health Hazard of Factory Air, by F. Müller-Voigt

Communal Hygiene Questions in the Field of Vermin Control, by J. Wilhelmi

Description of Apparatus Exhibited at the Chemical Exposition ("Achema"), by H. Bach

The subjects are all clearly and authoritatively treated, and profusely illustrated. The volume furnishes an exceedingly valuable summary of current practice in the field of sanitation. The questions are naturally discussed from the standpoint of applications to German conditions but references are frequently made to recent progress in other countries. Of the 350 delegates to this convention a considerable number came from foreign countries.

A. W. BUSHWELL

The Present Status of Preschool Hygiene in the United States—*By Frances M. Hollingshead, M.D., Director, Buffalo Foundation, Buffalo, N. Y.* 40 pp.

This monograph is one of the most comprehensive résumés prepared recently on preschool hygiene and represents careful research work. The monograph was originally presented as a paper before the Child Hygiene Section of the American Public Health Association at the 56th Annual Meeting at Cincinnati, O., October, 1927. This monograph of 40 pages has been put out in attractive form. Copies of it are available from the Buffalo Foundation, 714 Marine Trust Bldg., Buffalo, N. Y. A. B. T.

That Mind of Yours. A Psychological Analysis—*By Daniel B. Leary, Ph.D. Philadelphia: Lippincott*, 1927. 266 pp. Price $1.75.

This book is the outcome of a series of articles which have been running in the *Buffalo Evening News* for four years. The author describes it as "the story of modern psychology," and he professes to explain what psychology is, its problems and their solutions, as the modern psychologist sees them. He holds that there are real standards, but in the past we have gone from sandhill to sandhill, and only now have we discovered real solid foundations on which to build. This shows the optimistic vein in which the book it written.

Further on he acknowledges that there are many definitions of psychology, a number of which he gives and discusses. His first and simplest definition is that it is "a point of view," "a way of looking at human beings and their conduct." To those who have followed the reviews of a number of books on the subject during the past year, this is illuminating. The fact of the matter seems to be that psychologists themselves are not agreed on a definition, and have divergent views as to fundamentals. There are almost as many definitions as there are books on the subject.

The author is not a physician. He acknowledges, however, that many physicians have made notable contributions to the science, though they have not been students of psychology. On the other hand, he confesses to an opinion, which we believe the average physician arrived at many years ago, "that many so-called psychologists, particularly those of the inspirational school and the optimistic uplift Pollyanna persuasion, know little or nothing of biology and medicine."

The reviewer makes no pretense at being a psychologist in spite of the fact that an earnest effort has been made to understand what that profession is driving at. Some members have made real advances.

It must be remembered that this book is written for the laity, and we believe it to be better than the average of its class. M. P. RAVENEL

Fundamentals of Dairy Science—*By Associates of Lore A. Rogers in the Research Laboratories of the Bureau of Dairy Industry, U. S. Department of Agriculture. New York: Chemical Catalog Company, 1928.* 543 pp. Price, $5.50.

The accumulated wisdom of the ages with respect to the biology, chemistry, bacteriology, and general scientific aspects of milk and milk products has been assembled in this notable volume, to which numerous experts have contributed. Nearly everything now known and understood about this most important of the foods of man seems to be presented here in a thorough, accurate, and at times extremely technical manner. It is stated in the preface that the book is designed for advanced students and research workers in the field of dairy science. As a consequence, parts of it are far from popular in style, but all of it will be indispensable as a reference text to any scientist or sanitarian who is concerned in any manner with milk.

The four parts of this book take up: (1) the constituents of milk; (2) the physical chemistry of milk and milk products; (3) the microbiology of milk and its products; and (4) the nutritional value of milk, and also the physiology of milk secretion. Numerous references are given at the end of each chapter, and there is an excellent index. The book is exceptionally well printed and arranged, for which the publishers and the editorial committee of the monograph series of the American Chemical Society deserve credit. The book can be recommended highly as well worthy of the great scientist and teacher to whom it is dedicated. JAMES A. TOBEY

Laboratory Manual for General Biology and Fundamental Embryology —*By John Giesen. (2d. ed.) Milwaukee: Bruce Pub. Co., 1927.* 215 pp., 11 figs. Price, $1.80.

This is a laboratory guide for a typical elementary course in elementary zoölogy and botany, and the embryology of the frog and chick. It is in the form of a terse didactic outline of directions, with some supplemental data on the sources and care of laboratory material and the making of microscopical preparations. The author has not brought his nomenclature up to date, but still uses *Distomum* for *Fasciola* and *Trichina* for *Trichinella*. C. A. KOFOID

Anthelmintics and Their Uses in Medical and Veterinary Practice —*By R. N. Chopra and Asa C. Chandler. Baltimore: Williams & Wilkins.*, 1928. 291 pp. Price, $5.00.

The present work is an extremely thorough and painstaking review of the subject of anthelmintics and reflects the wisdom of combining the viewpoint of a pharmacologist with that of a helminthologist. It is divided into three sections. Section I deals with general considerations such as methods of administration and investigation and with the correlation between chemical composition and anthelmintic action of drugs. In surveying the therapeutic agents that have been discovered the authors point out that among the intestinal worms, hookworms and their allies, ascarides, stomach worms and flukes are fairly susceptible; tapeworms moderately so; but oxyurids, *Strongyloides, Trichostronglus* and *Trichuris* are in the main non-susceptible. Only recently has progress been made with the somatic forms. Fair treatments have been devised for liver flukes, schistosomes and lung worms, but no effective treatment has been found for the filariae. This section also includes a general survey of the worms infecting man and domestic animals to which is appended a key for eggs, larval forms and adults of the common worms.

In section II which deals with the drugs acting on gut parasites, two chapters are devoted to drugs acting on cestodes, the best known of which are male fern and allied drugs; ten chapters are devoted to drugs acting on nematodes and in the long list of agents especial attention is paid to such important remedies as carbon tetrachloride, oil of chenopodium, santonin and thymol. Chapter XV lists a number of proprietary anthelmintics, but the authors remark that although some of these have given fairly good results, they prefer to use ordinary drugs whose pharmacological and toxic actions are better known.

Section III consisting of three chapters is devoted to anthelmintics used against somatic worm infections. Particular attention is given to the antimony compounds and emetine and their use in schistosomiasis. The authors believe that emetine is not so efficacious as the antimony tartrates in the treatment of schistosomiasis and is, furthermore, much more expensive.

Throughout, each of the more important drugs is considered from the standpoint of history, source, chemical composition, pharmacological action and toxicity, dosage and anthelmintic effect. An exceedingly important feature of the book is an extensive bibliography covering 22 pages. The index is very well arranged in that the practical worker can find a list of the various drugs under each genus of worms. The present volume will be almost indispensable for either medical or veterinary workers interested in the treatment of worm infections, and should find a place in all laboratories dealing with any phase of experimental helminthology.

W. H. TALIAFERRO

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Portsmouth, Va.—Published as a part of the report of the city manager, the 1926 record of the Department of Public Welfare is creditable. A general death rate of 11.5 is somewhat higher than that for 1925 (10.7), due in part to a slight increase in deaths from pneumonia and cerebral hemorrhage. Six diseases caused over half of the 691 deaths, as follows: tuberculosis 38, cancer 23, cerebral hemorrhage 95, pneumonia 88, diseases of the heart 59, and chronic nephritis 57. It is noteworthy that only 1 death from typhoid was recorded. There were 1,029 births; and 100 infant deaths, of which 28 occurred during the first day, and 55 during the first month of life.

The laboratory division report shows a good range of examinations, with a total of 5,135, classified according to type. Commendable progress in this division is noted in comparison with the previous year.

Under the nursing division, it is noted that home nursing classes have been carried on, a central clinic, chiefly preventive, has been opened, and a health station, started in a colored section, has been active.

Newport, R. I.—The 1927 report of the Newport Board of Health is well arranged and informative. New and more spacious offices in the City Hall, with new equipment for laboratories and a dental clinic are noted. This city of 30,044 population, reports 447 births and 316 deaths, and an infant mortality rate of 40 deaths of infants per 1,000 births. A classified financial statement indicates an expenditure by the health department of $25,778 for collection and disposal of wastes, and $20,067 for purely health purposes.

There were 5 cases of diphtheria with no deaths. A total of 2,689 children were given toxin-antitoxin, and 1,528 were given subsequent Schick tests, while 1,631 children who had not been previously immunized were given the Schick test. Active milk supervision has been exercised. The report concludes with many statistical tables worthy of study.

Hartford, Conn.—The 43rd report of the Hartford Board of Health for 1927 has a good light yellow cover, and on the second page contains an excellent statistical summary for the years 1926 and 1927. This city of 168,258 population had a resident death rate of 9.44, a resident birth rate of 20.2 and an infant mortality rate of 68.5. The death rate from pulmonary tuberculosis was 61.8. A decrease in deaths from lobar and broncho-pneumonia is recorded. Several good charts, most of them covering periods from 1881, and numerous statistical tables add interest to the report of progress.

Another year of successful coöperative work for infants and preschool children with the Visiting Nurse Association is noted by the health officer. Under the terms of the agreement, the city employs the V. N. A. as its agent to do the routine work at the health stations, and bills for their services at cost are rendered by them each month to the Board of Health. A total of 6,303 cases were registered, with 19,000 visits to the stations, in addition to the nursing visits to homes. A classified financial statement, with comparative figures for 1926 and 1927, shows a per capita expenditure in the latter year of $1.40.

Greenville, S. C.—Greenville's annual report for 1927 is published in the monthly bulletin and is a record of prog-

ress for this city of 33,000 people. The number of diphtheria cases reported was half the number of the previous year, with no cases reported among colored children. During the past 2½ years, all of the colored school children have been immunized. A resident death rate of 10.5, with no deaths from diphtheria, scarlet fever, or typhoid fever, and an infant mortality rate of 73.5 are recorded. The standard milk ordinance was adopted in 1926, and a new ordinance is now before the council governing the manufacture and sale of ice cream. All slaughtering is done in a modern abattoir where ante-mortem and post-mortem inspections are made. An annual appropriation of $1,500 per year is made for mosquito control work.

Los Angeles County, Calif.—The annual report of the board of supervisors of Los Angeles County, Calif., (year ending June 30, 1927) contains 318 pages with many financial and statistical tables, several attractive photographs, and a small amount of descriptive text. An effort is being made to protect unincorporated areas through proper zoning and the establishment of definite building lines in districts where deed restrictions have expired. It is stated as the policy of the Regional Planning Commission to obtain from, or have reserved in the larger subdivisions, suitable park, school playground, beach or other open spaces of recreational or public nature in order to maintain a balanced community.

In the health department report section it is learned that during the early part of the year, a severe epidemic of smallpox was quickly stamped out and 160,000 people were vaccinated free, "representing a saving to the people of at least $200,000." During the year vaccines and serums for prevention of disease were distributed at a cost of approximately $15,000. The population is said to have increased 2½ times during the past 3 years, but communicable diseases have not increased to a similar extent. Laboratory services were increased 100 per cent in a year, for bacteriological work, and 30 per cent for chemical analyses.

Preventive work in tuberculosis control is carried out through the summer schools in coöperation with the county tuberculosis association. The infant mortality rate of 41 per 1,000 births is a record for a large rural district. There were 25,576 mothers who received free service on the education of the child at the health centers during the year. Cooperation has been established with 135 school districts in the joint employment of public health nurses. Twenty-five cities have coördinated their work with the county health department.

American Child Health Association.—The *Fourth Annual Meeting Transactions* (May, 1927) of the American Child Health Association are published in a volume of 380 pages. This is a valuable compilation of addresses dealing with the various problems of modern child hygiene work. Here may be found enlightening discussions of progress in child health as viewed by national organizations; the promotion of child health through recreation; trends in federal and state child health work; and experience in medical schools with courses in preventive pediatrics. Many interesting graphs, statistical tables, and charts are reproduced to show the present status of different aspects of health work as compared with earlier years.

The coöperative program of the association is effectively outlined by the general executive. "What we covet, therefore, is the opportunity of securing productive coöperative service, when desirable and expedient, with the official agencies upon which government has placed the responsibility of advancing the cause of child health. It has also been our pleasure to join with other

voluntary health agencies and with the great national social and civic groups in the fields of our common interest and endeavor."

As an illustration of the type of cooperative work undertaken, the nationwide campaign for clean and safe milk is described. After a working plan for a state survey has the joint approval of the state department of health, the state dairy commissioner and the representative of the association, the work starts in the survey phase. An effort is made to secure a picture of the actual sanitary and chemical quality of the marketed milk in a cross-section of the state, together with definite first hand knowledge of the problems associated with milk production and distribution. Experts then point out the defects in routine methods and equipment, and offer suggestions for betterment. Finally comes the phase of interpretation and promotion when, through carefully planned follow-up of the survey, the results are interpreted to the various civic and social groups and the importance of milk in the dietary of the growing child is stressed.

Educational workers proceed similarly with respect to the schools. They sample and analyze educational thought and practice relating to school health programs; and interpret, demonstrate, and promote activities along modern lines of accepted practice. At present, the association is engaged in a study of the effectiveness of the health program in the schools of the country which should yield valuable information that may be used to measure, in terms of health status, habits and knowledge of pupils, and the effectiveness of existing school health activities.

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CANCER: A PROFESSIONAL RESPONSIBILITY AND A PUBLIC LIABILITY. By Albert Soiland, M.D. New York: Appleton, 1928. 143 pp. Price, $1.50.

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SCHOOL HEALTH PROGRAMS FROM MANY LANDS. A Report of the Health Section of the World Federation of Education Associations held at Toronto, Can., August 8-12, 1927. New York: American Child Health Association and the Metropolitan Life Ins. Co., 1928. 209 pp. Price, $.50.

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Typhoid Fever in 1927—Seven of the cities of more than 100,000 population had no typhoid fever deaths. Seventy-four had less than 2 per 100,000. There has been a progressive decline in each group for the past 3 years.

AXON. Typhoid in the Large Cities of the United States in 1927. J.A.M.A., 90:20 (May 19), 1928.

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COOKE, J. V. Scarlet Fever. Am.J.Dis.Child., 35:5 (May), 1928.

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FARR, E. C. Present Tendencies Regarding Disinfection. J.Roy.San.Inst., 47:11 (May), 1928.

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NEWS FROM THE FIELD

LIVESTOCK LAWS

A close check-up on the laws governing the interstate movement of livestock and veterinary biological products, which has been made recently by the Bureau of Animal Industry, U. S. Department of Agriculture, has resulted in fines and jail sentences for the offenders. In the case of livestock quarantine laws, 4 violators were fined from $100 to $250 for driving or shipping cattle interstate without previous tuberculin test. Another violator was jailed. Five railroads were also penalized from $100 to $400 each for violating the 28-hour law, providing for the unloading of live stock for feed, for water and rest.

The license of one firm producing biological products has been revoked and another license has been suspended. Investigation showed conditions in the laboratories to be defective, insanitary and improperly conducted and the products contaminated.

COURSE FOR CONTINUATION SCHOOL WORKERS

A course in health education for workers in continuation schools will be inaugurated at Teachers College, Columbia University, with the opening of the college term in September, 1928. This is the first course of the kind ever to be offered in any university. The course is planned to meet the specific needs of continuation schools as they have been determined by a study made recently of the New York City Continuation Schools. The course will include Safety & First Aid in the Job; Posture and the Job; Nutrition for the Worker.

The course has been approved by the New York Board of Examiners and will be accepted for credit toward a teaching license for continuation schools. Thomas A. Wood, M.D., professor of health education, Teachers College, will direct the course and will give some of the lectures. The lecturers also will include Hugh Grant Rowell, M.D., assistant professor of health education, and Anette M. Phelan, instructor in health education, Teachers College, John D. McCarthy, M.D., director health education for New York City Schools and others prominent in this field.

ROCKEFELLER HEALTH PROJECTS

MORE than $11,000,000 was expended in 1927 by the Rockefeller Institute according to the report of George E. Vincent, M.D., president. Among the public health projects in the United States promoted by the Rockefeller Institute in 1927 were:

Aided local health organizations in 85 counties in 6 states in the Mississippi flood area.

Operated an emergency field training station for health workers in flood area and 9 other training stations elsewhere.

Assisted 9 schools or institutes of public health and 3 departments of hygiene in university medical schools.

Had a part in malaria control demonstrations or surveys in 8 southern states.

Contributed to the health budgets of 268 counties in 23 states.

Helped to set up or maintain public health laboratory services, or divisions of vital statistics, sanitary engineering or epidemiology in state health departments in 16 states.

Made grants for mental hygiene work.

Provided funds for biological research at 3 American universities.

T-A FOR PRESCHOOL CHILDREN

THAT health education properly directed coupled with effective organization will bring results is shown by the record of Batavia, N. Y., in its toxin-antitoxin campaign. During February and March, 910 children received three doses of toxin-antitoxin and of this number 312 were of preschool age. School

authorities, both public and parochial, the Parent-Teacher Association group, and the local newspapers coöperated in the campaign. The local board of health appropriated $500 to pay the physicians who volunteered their services at the clinics.

POUGHKEEPSIE CITY FATHERS PROMOTE T-A DRIVE

THE Board of Aldermen of Poughkeepsie, N. Y., made an appropriation, by unanimous vote, of $2,000 to meet the expenses of a toxin-antitoxin campaign carried on in May. An arrangement was made to pay physicians in charge of the clinics $50 per clinic.

LYNN HABIT CLINIC

A new habit clinic has been established in Lynn, Mass. The clinic will be in charge of Dr. C. A. Bonner, superintendent of the Danvers State Hospital, Lynn, Mass., who is an expert in the field of mental hygiene of children. The clinic staff also includes Mary H. Holland, social worker, and Esther Reid, psychometrist.

PROTEST AGAINST DR. LEVY'S DISMISSAL

AROUSED by the removal of Dr. E. C. Levy as health officer of Tampa, Florida, for political reasons only, the Hillsboro County Medical Society, Florida, has gone on record protesting against his removal.

Commending Dr. Levy for his harmonious coöperation with organized medicine and referring to the complete confidence of the medical profession which he enjoyed, the local medical society, through its committee on resolutions, with J. C. Mills as chairman, went on record claiming:

> That in being deprived of the services of a man whose work here in Tampa has fully borne out his previous reputation as the best municipal health officer in the United States, Tampa has lost not only a most efficient guardian of the health of its people, but also that prestige and distinction that comes from having such a man at the head of its Health Department.

TEXAS TO BUILD CHEMICAL LABORATORY

THE Texas State Board of Health recently made provision for the erection of a $25,000 state chemical laboratory to be directed by Dr. S. W. Bohlo. Dr. Bohlo will continue to direct the Pasteur Institute which is to be combined with the state laboratory. Maudie Marie Burns will be pathologist of the new laboratory.

The laboratory will be built on a state-owned square in the City of Austin and ready for occupancy September 1.

ECUADOR NEW PUBLIC HEALTH LAW

THE public health law of Ecuador of June 17, 1927, provides punishments of from 1 to 5 days in prison and fines of from 1 to 100 sucres, or both, for parents or guardians guilty of the following:

Placing child with nurse not having a certificate of health from a physician

Failure to have a child vaccinated against smallpox within a certain period of time

Leaving child locked in the house and going away to work

Failure to provide medical care promptly in case of a child's illness, when such neglect results in the death of the child

Punishments as stated above are also provided for mothers who decline to feed their children at the breast without having a physician's certificate stating their inability to do so.

RECENT DEVELOPMENTS IN CHILD WELFARE WORK IN MEXICO

STUDY of physical development of school children—The Department of Public Education of Mexico has just completed a report of an investigation of the physical development of school children between the ages of 4 and 17 in the Federal District. This investigation, which lasted 3 years, included mental as well as physical measurements.

Physical examination of school children—Physical examination of school children in Mexico City, which has been in practice more than 3 years, has been made more extensive this year. All children in the primary schools will be exam-

ined once a year and those needing medical attention will be sent to clinics and dispensaries for free treatment. All children in the secondary, technical, and preparatory schools will also be examined; they will not be sent to dispensaries, but will be given advice necessary for the treatment of the disorders found and the prevention of disease. The Bureau of Hygiene of the Department of Education is also concentrating its efforts on inculcating good health habits among the school children.

New measures with regard to kindergartens—A new division, that of general inspection of kindergartens, was established under the department of education. The staff of this division is in charge of a woman teacher, and consists of several women inspectors of kindergartens. Provision has been made by the new division for the establishment in Mexico City of 18 additional kindergartens as annexes to public schools. For this purpose the poorest districts have been selected.

PRENUPTIAL CONSULTATION CENTERS IN ITALY

A prenuptial consultation center was recently established in Genoa. Two others had been established previously, one in Milan and one in Turin. At these centers persons intending to get married are examined by physicians, and those already married are given hygienic and medico-legal advice.

ITALIAN NATIONAL BUREAU FOR MATERNITY AND CHILD WELFARE

ACCORDING to official information, the National Bureau for Maternity and Child Welfare of Italy, established in 1925, gave subsidies in 1927 of 5½ million lire to 428 maternity and infant welfare agencies, and of 6½ million lire to 696 summer camps in which 180,000 children were cared for. Other activities of the bureau included inspection of 509 institutions for children; giving 50 courses in child care for physicians, midwives, and trained welfare workers; establishment of 9 traveling courses in child care; and operation of 55 traveling child health centers and 53 pediatric and obstetric clinics.

FIRST CUBAN NATIONAL CHILD-WELFARE CONGRESS

A committee under the chairmanship of the Secretary of Health has been working on plans for the First National Child Welfare Congress in Cuba and has decided to hold the congress in December of this year. The congress will continue the work of the Fifth Pan American Child Congress, which was held in December, 1927. Its main objects will be:

1. To bring to the attention of the nation the necessity of giving good care to children
2. To familiarize the public with the progress made in the study of the child
3. To promote the study of hygiene, pediatrics, child psychology, and education
4. To work for the enactment of child-welfare legislation

The Congress will be divided into the following five sections: Hygiene, medicine, psychology and education, sociology and legislation, and defective and delinquent children.

CUBA'S TUBERCULOSIS CAMPAIGN

AS a part of Cuba's anti-tuberculosis campaign, plans for which were prepared by the Department of Health, the government has appropriated 3,000,000 pesos for the construction of several sanatoriums for tuberculous persons. Plans have been made also for the introduction of compulsory reporting of cases of tuberculosis by physicians; extension of the visiting nurse system; keeping of complete statistics of cases of tuberculosis; and education of the public through literature, lectures, motion pictures, etc.

Preventoriums for children in delicate health who are not tuberculous will also be established.

PERSONALS

DR. J. W. H. SMITH, formerly with the New Highland Sanitarium and Clinic, Martinsville, Ind., has become associated with the Ohio Valley General Hospital, Peterson Laboratory, Wheeling, W. Va.

DR. R. A. STEPHEN has been appointed City Health Officer of El Cerrito, Calif., to take the place of Dr. W. W. Fraser.

DR. JOHN D. KEYE is now City Health Officer of Holtville, Calif., having succeeded Dr. W. F. Mosher.

DR. BENJAMIN H. VIAU has been appointed City Health Officer of Sanger, Calif.

DR. HENRY L. K. SHAW, the first director of the New York State Division of Child Hygiene upon its creation in 1914, and since August, 1919, a department consultant in child hygiene, was elected president of the American Pediatric Society at the annual meeting held at Washington during the week of May 7.

DR. W. A. DAVIS has been named secretary of the Texas State Board of Health.

ERNEST LEMAY of Austin, Tex., is the new director of the food and drugs section of the Texas State Board of Health.

DR. GEORGE H. WILLCUTT has been appointed City Health Officer of Ross, Marin County, Calif. to succeed Mr. M. H. Edgar.

SURGEON R. M. GRIMM has been relieved from duty at the American Consulate at Antwerp, Belgium, and has been assigned to duty in the American Consulate in Dublin, Irish Free State.

SURGEON C. H. WARING has been relieved from duty at the Hygienic Laboratory, Washington, D. C., and has been assigned to duty in the American Consulate in Antwerp, Belgium.

A. L. DOPMEYER, Associate Sanitary Engineer, has been relieved from duty in Interstate Sanitary District No. 4, Memphis, Tenn. on June 15, and has been asigned to duty in Interstate Sanitary District No. 5-6, in San Francisco, Calif.

DR. PERRY F. PRATHER, Hagerstown, Md., has been reappointed Health Officer of Washington County, Md.

EDMUND V. COWDRY, Ph.D., of the Rockefeller Institute for Medical Research, New York, N. Y., has been appointed Professor of Cytology in Washington University Medical School, St. Louis, Mo.

DR. GEORGE M. JENNINGS, Missoula, Mont., was elected president of the State Board of Health on April 5.

SIR ARTHUR NEWSHOLME, formerly Principal Medical Officer of England and Wales, visited New York City, to make a study of the Health Department's reorganization plan.

DR. GOLDSBOROUGH F. MCGINNES has been appointed Director of Laboratories of the Virginia State Department of Health to succeed Aubrey H. Straus, who has tendered his resignation, effective June 15. Dr. McGinnes was formerly Health Officer of Isle of Wight County, Va.

DR. WILLIAM F. WILD, formerly with the American Child Health Association and with the American Society for the Control of Cancer and the Minnesota Public Health Association, has been appointed Health Officer of Bridgeport, Conn.

DR. JAMES W. BENHAM has been appointed Health Officer of Columbus, Ind. to succeed Dr. John R. Miller.

DR. RODNEY M. AREY has been appointed City Health Officer of Muscatine, Ia., to succeed Dr. Arthur L. Bryan.

CHARLES-EDWARD A. WINSLOW, Dr. P. H., Professor of Public Health at Yale University, has been appointed Cutter Lecturer on Preventive Medicine at Harvard University for 1928-29.

DR. THOMAS R. BROWN, Baltimore, Md., has been reëlected president of the Johns Hopkins Medical Alumni Association.

DR. FRANK A. HOHENSCHUH has been appointed City Health Officer of Clifton, Ia.

DR. ERESTUS T. HANLEY has been reappointed City Health Officer of Seattle, Wash.

DR. JOHN A. WESSINGER has been reappointed Health Officer of the City of Ann Arbor, Mich. for a term of three years. Dr. Wessinger has served the city continuously for twenty-two years.

ANNE HASBROUCK, formerly with the Brooklyn Health Council, became superintendent of the Reconstruction Home at Elmira, N. Y. on June 1. This institution is supported by the State District Rotary Club.

DR. H. B. EHLE has succeeded Dr. G. S. Martin as Health Officer for Lassen County, Calif.

DR. W. H. ZIEBER has been appointed City Health Officer for Menlo Park, San Mateo County, Calif.

HENRY P. TALBOT, M.D. has been appointed chief of the division of venereal disease, Connecticut State Department of Health. He assumes his duties July 1. Dr. Talbot was formerly with the Public Health Service, Marine Hospital at Ellis Island.

DR. A. J. BURCH has been appointed part-time Health Officer of Catron County, N. M. He is successor to Dr. A. A. McDaniel who has moved from the county.

CONFERENCES

August 6-10, American Hospital Association, San Francisco, Calif.

August 6-10, American Occupational Therapy Association, San Francisco, Calif.

September 12-14, Southern Conference of Tuberculosis Secretaries, Biloxi, Miss.

September 17-19, Mississippi Valley Conference on Tuberculosis, Des Moines, Ia.

September 18-21, New England Water Works Association, Montreal, Can.

September 25-28, American Roentgen Society, Kansas City, Mo.

October 4-6, Association of Military Surgeons of the United States, Baltimore, Md.

October 11-13, Canadian Public Health Association, Winnipeg, Can.

October 11-13, International Association of Dairy and Milk Inspectors, Chicago, Ill.

October 15-16, Conference of Illinois State Health Officers, Chicago, Ill.

October 15-19, American Child Health Association, Chicago, Ill.

October 15-19, American Social Hygiene Association, Chicago, Ill.

October 15-19, American Public Health Association, Chicago, Ill.

FOREIGN

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

July 28-August 4, World Federation of Education Associations, Geneva, Switzerland.

September 25-27, Sixth International Conference on Tuberculosis, Rome, Italy.

October 29-November 1, Second International Conference on Light and Heat in Medicine, Surgery and Public Health, London, England.

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